

CACTUS AND SUCCULENT JOURNAL

VOL. XXX JANUARY-FEBRUARY, 1958 No. 1



FIG. 1. *Ferocactus gracilis* in the Ilanos Agua Dulce or Sweet Water Plains near Catavina, Baja, California. Picture taken by Charles Polaski of Oklahoma City. This plant grew from a seed lodged in the crevice in the top of a solitary granite boulder. *Idria* in background.



CACTUS AND SUCCULENT JOURNAL

Published and owned by the Cactus and Succulent Society of America, Inc., 132 W. Union St., Pasadena, Calif. A magazine to promote the Society and devoted to Cacti and Succulents for the dissemination of knowledge and the recording of hitherto unpublished data in order that the culture and study of these particular plants may attain the popularity which is justly theirs. North and South America \$4.00 per year; foreign \$4.00 by money order. Mail application to SCOTT HASELTON, Editor, 132 West Union Street, Pasadena 1, California. Editorial Staff: THE ENTIRE SOCIETY. Entered as second Class Matter at Pasadena, Calif., under act of March 3, 1879. Published bi-monthly. We reserve the right to accept or reject advertising or articles sent to this JOURNAL.

VOL. XXX

JANUARY-FEBRUARY, 1958 (Price 75¢)

No. 1

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THE PRESIDENT'S MESSAGE

During 1956 and 1957 it has been my privilege to be president of the Cactus and Succulent Society of America. This has been a rewarding experience and I have learned much. It has been a pleasure to meet many people with a common interest in succulent plants.

During this term of office many individuals have been remarkably helpful, both with valued advice and with hard work in getting jobs done. The cooperation of officers and members of this Society and the affiliated societies is much appreciated, and it will be remembered for a long time. This is true not only for the 1957 convention of the Society at Berkeley, but also for the many other activities of our organization. It has been pleasant to work with everyone, and I wish to express my thanks to all.

It is a pleasure to know that next year's president will be Harry Johnson, Sr., a long time benefactor of the Society and a hard worker within it. I give him my congratulations upon his election and my loyal support in the undertakings of the Society. We are fortunate in having a man so outstanding to assume the presidency for 1958.

LYMAN BENSON

EDITOR'S NOTES

The year of 1958 starts with the largest Journal circulation in 29 years. This is a very healthy condition and shows a renewed interest in our hobby. The Journal is still partially dependent on the book sales of Abbey Garden Press and the loyalty of our members in buying books from this press has made another concession possible. Before the end of the year we will supply lists of the members of the Society, according to sections of the country. This will help you know who, in your state, are growing cacti and also when you take a trip, what collections to see. During the Conventions, this should be very worthwhile.

We are pleased to announce that the New York Cactus and Succulent Society and the Oregon Cactus Society have followed the lead of the Cactus and Succulent Society of California (San Francisco Bay area) and

require all their members to subscribe to our Journal. Instead of asking, "what can you give us," these three societies are showing "what we can do for the Journal."

One of the most valuable contributions during this last year has been Mrs. Shield's series "Desert Flowers Under Glass." Many new members have requested that their subscription start with the beginning of her articles. As you will have noted, Mrs. Shields is mentioning many of the old, well known plants that have almost become forgotten in Journal articles. For those who did not obtain last year's Journals (still available for \$4) we are publishing again the list of seasons in New Zealand where her plants are grown. To many of us it is confusing to read about their summer which is our winter.

The Editorial staff thanks the many kind notes and cards received during the holiday season. It is such expressions that make this work so worth while.

SCOTT HASELTON

NEW ZEALAND SEASONS

Early Spring.....	August	} Spring
Mid Spring.....	September	
Late Spring.....	October	
Early Summer.....	November	} Summer
Mid Summer.....	December	
Late Summer.....	January	
Early Autumn.....	February	} Autumn
Mid Autumn.....	March	
Late Autumn.....	April	
Early Winter.....	May	} Winter
Mid Winter.....	June	
Late Winter.....	July	

NEW OFFICERS FOR THE CACTUS AND SUCCULENT SOCIETY OF AMERICA, INC.

President: Harry Johnson Sr.

Vice-president: Don Skinner

Secretary: Ethel Rush

Treasurer: Robert T. Craig

Board of Directors: George Lindsay, Reid Moran, Bob Killian, Yale Dawson, and Homer Lawson.



FIG. 2. Cactus garden in winter on the high desert

CACTUS ON THE HIGH DESERT IN CALIFORNIA

By CHRISTENA FEAR BARNETT

Photos by Jessie Hax, Yucca Valley

Mr. "Cactus" Johnson's answer in the *Journal* to Mr. Barney who wants a fast growing cactus fence on the high desert sounds discouraging. Since Mr. Barney wrote from Glendale but plans his cactus for Apple Valley, California, one assumes that he has joined the ever increasing ranks of city dwellers who maintain a week-end "escape-from-it-all" on the desert.

If this is the case, he probably does not want to work very hard for his cactus hedge and chances he can find help for hire are practically nonexistent. Then, too, he may be one of the thousands who have acquired a government five acre "Jack Rabbit" homestead. This, in most cases, means that he either carries his own water supply or has it expensively brought in by tank truck. (Depending on the distance the water is hauled, the cost for a thousand gallons varies from \$6.00 to \$24.00.)

From personal experience, I can say that under the circumstances we are assuming, he had better accept Mr. Johnson's suggestion of planting only the cactus of his own area. (Sorry, no quick growing cactus fence.) Only if he wants to work a little harder and spend more for water, should he even branch out into the species listed by Mr. Johnson.*

Not knowing when I am licked, I have had a considerable measure of success in growing a few types of the more frost susceptible cacti on the high desert. This has been accomplished with all the disadvantages; tank truck water, not over two days a week on the desert and no labor for hire. Instead of Mr. Barney's 2000 foot elevation, ours is a colder in winter, almost as hot in summer, 4000 feet near Joshua Tree, California. It is common to have temperatures of 14° above zero, it can drop to zero and frosts may come as early as October and as late at May. During January, February and March one can expect snow. Then there are dehydrating summer winds which cut through one's leather jacket and red "longies" like a knife through soft butter. (Don't let this discourage you about desert living, even Paradise must have some flaws.)

My original plan which will keep me busy the rest of my life, was to establish an experimental garden of the native plants of California—excluding cacti. There have been moments of regret that I now do grow them—213 in addition to those growing wild on the property. One such occasion arose when I was lugging a great slab of verde antique down a steep hillside and fell backwards. It was 117 "bayonets" (not glochids to me) that the doctor carved out.

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Of course, I was not satisfied with just the innumerable types of natives to be found on our own property and in the adjoining area. Ted Hutchison of Calico (well known in all western botanical circles) gave me invaluable advice. If you *must* grow what *cannot* be grown on the high desert, then obtain your plant materials as nearly as possible from the same (or higher) elevation as your own and force the plants into semi-dormancy well in advance of frost. From there on, I was on my own with the time consuming trial and error method.

Almost two years were wasted discovering that I was *not* Mother Nature. She often grows a shrub, tree or cactus out of apparently solid rock. When we mere mortals wish good results with the same plant, there has to be careful soil preparation, food and water as well as shelter from winter cold and summer heat for the young and more tender things.

Eventually I found that nearly all the rules

which applied to growing other plants on the desert were equally applicable to cacti. Ever notice that the cactus babies one finds growing wild are always under protection of a shrub or a overhanging rock? My desert soil is full of Nature-scattered cactus seeds which further show their love of coddling by springing up in watering basins strictly not intended for them.

Most of us laymen do not at first realize that cacti are among the least drought resistant of all desert plants. The last five years of drought show this with *Acacia greggii* (cat's claw) and *Larrea divaricata* (creosote bush) standing fresh and green by dead or dying cacti. Many desert shrubs can appear absolutely lifeless for several years and spring back to foliage and flowers when there is rain. When a cactus looks dead, it usually is. Most of our desert cacti have shallow roots to take advantage of the summer thunder showers which have been few and far between for three seasons. All this is just a round about way of

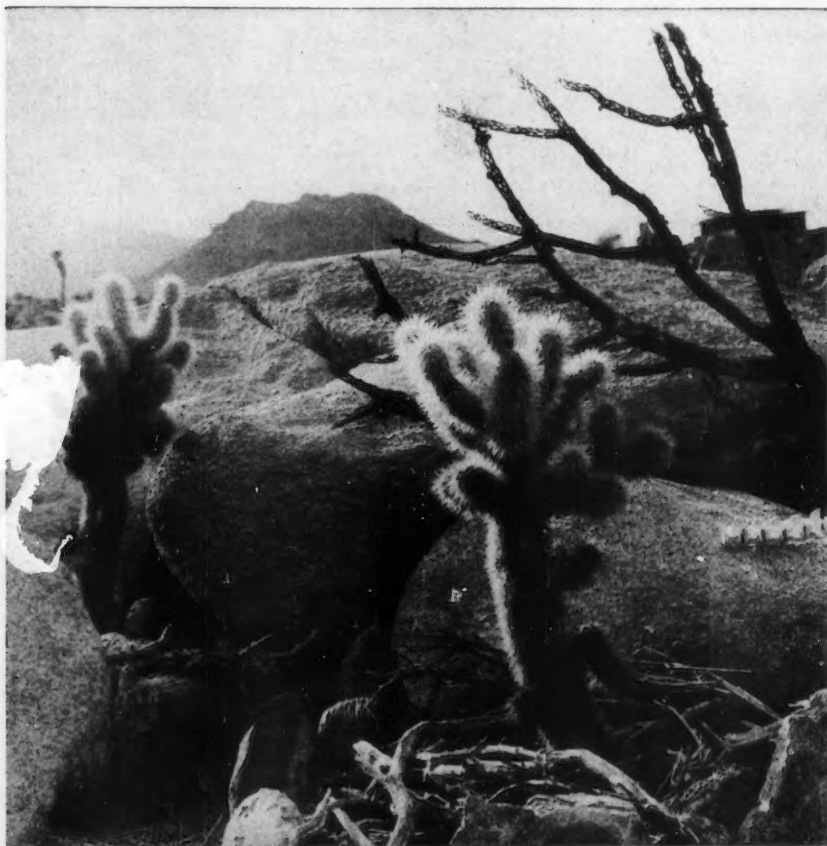


FIG. 3. *Opuntia bigelovii*. Growing close by is one of the native Dudleyas



FIG. 4. *Opuntia robusta* grown from a two-pad, unrooted cutting in 12 months

saying, "don't plant 'em unless you will water 'em."

Now to be more specific about my experiences in growing cacti. First I started shifting specimens of the five species growing wild on our own property, moving them closer to the cottage where they could be better seen. While I lost only one such transplant (cut worm damage) there was no noticeable growth until I realized they needed more water. Soon I started adding more species but strictly keeping to those approved for the area by such desert experts as Ted Hutchison and Cactus Slim Moorten of Palm Springs. Then I became more reckless and tried species neither of those gentlemen would approve.

PLANTING TIME

My most successful planting time, not only for cacti but all other most delicate plants, has proven to be early fall. It is a tricky matter with freezing weather coming up soon, to apply just the right amount of water. Too little and they die, too much will start new growth which will freeze. As described further on, winter protection must be given. Spring and early summer, even under my conditions, are not too bad for cacti but with the limited time and water at my disposal, there is almost a 50% loss on all other plants unless set out in the fall.

PLANTING

On our property there is almost every type of soil from pure sand to solid granite. On the hilly areas where the soil is heavy and full of large rocks, I dig out a hole deeper and wider than the roots are expected to ever need. If there is commercial leafmold on hand, I use it. If not, I gather up a few buckets of the good soil to be found around a dead *Erigeron* of the type known as "wild buckwheat". (This buckwheat is the best ever soil maker.) This is mixed with a few handfuls of steamed bone-meal and sandy soil and deeply soaked. In instances where there is hardpan at the bottom of the hole, a commercial soil conditioner is applied and a few rocks thrown in for drainage. In sandy soil it is necessary to use a greater proportion of leafmold and to bank the edges of the basin with rocks to keep sand from shifting in and covering the plant too deeply. (Shifting sands covering the crown kills more plants on the desert than almost any one other cause. Only a few like *Larrea* (creosote) and the two *Prosopis* (mesquite) seem able to adjust to sand coverage.) When one has a choice, choose the heavier soil as it will cut water costs.

When the cactus is planted, the basin is again soaked. The plant may be staked but I usually support it with heavy rocks around but not quite touching the base. A mulch is a must; leafmold, straw or my own standby, needles picked up

from under an *Ephedra* (squaw tea). On top of the mulch I scatter flat rocks to aid in keeping the roots cool. These must have spaces left between or the showers cannot penetrate. If growth is not of interest, the rock mulch alone will do or one made of broken twigs of nearby dead vegetation.

After the plants have been in approximately a year, fall has arrived and watering stopped, I work in a little more bone meal and apply a manure mulch with the rocks again on top. (Never use manure in summer.)

If the particular plant is from the lower, warmer desert as *Opuntia bigelovii*, the year's new growth will need winter protection. If it is one accustomed to neither extremes of heat or cold, there must always be heavy winter protection and a lighter heat protection for the hottest months, particularly the first year. The latter type will need extra leafmold in the soil and should be planted where neither the strongest winds or the hot afternoon sun can strike. Do not plant them at all unless able to water them once a week during the summer.

Those tender things prove irresistible to the rodents. If you try them, you will have to fence with fine chicken wire with rocks laid at the base, to keep the rabbits from digging under. The smaller rodents can still climb through or over. The San Bernardino County Agriculture Department sells at cost to its taxpayers, a poison

bait which is safe to use where there are small children or pets as it must be eaten for two weeks to prove fatal. You still can't catch the chipmunks so few snakes and a family of cats are indicated. The cats must have a refuge to which they can flee when the coyotes are out, a shaded water pool and some one to feed them when you are not in residence. Only cats born and reared on the desert can take over this job without ending up as a coyote's dinner. Once a dynasty of cats is established, fences and poison baits are unnecessary. If one is in permanent residence, a dog does fairly well but it really takes cats or snakes to do a thorough policing job.

All the cactus, even of one's own high desert area, needs to be semi-dormant by the first of October. This means no water after September first. However, you just might have unseasonably hot weather in September and have to give them just enough water to keep them alive. On our own property, I have seen *Opuntia basilaris* (beaver tail) killed by frost when planted by Nature and never fed or artificially watered. This was when a fall rain was followed by hot weather which forced new growth too late.

The type of winter protection which one must give plants which are susceptible to frost or which have made late lush growth, is up to the individual gardener. What I do is to dash out in the station wagon and pick up scores of tall,



FIG. 5. This *Opuntia* has deep rose flowers. *Mammillaria elongata*, *Opuntia ursina*, and *O. robusta* can be seen. The wire cage on the left protects the desert holly

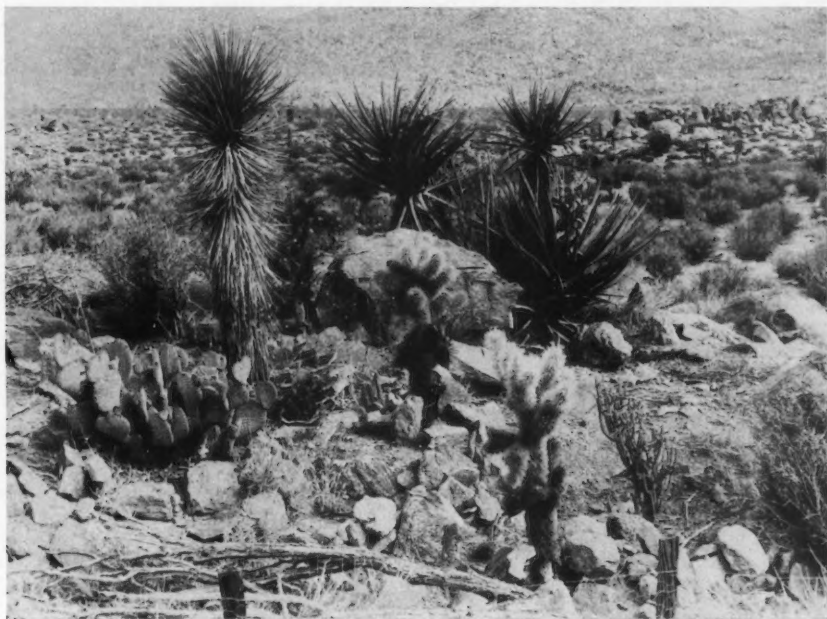


FIG. 6. A new bed under construction on a rocky mound where it was necessary to blast for a basin for the Yuccas

branching dead chollas. (Unfortunately there are plenty of them. Very attractive they are with the prickly "fur" removed and the holes showing against the grayish stems.) These I drape over the plants and fill in with brush, leaving air and sun some chance to filter through. Just before frost actually arrives, the more tender things have a bit more brush added. When there is lush tip growth in spite of my efforts to force dormancy, some of the fine stemmed dry grasses are padded around the danger point.

It is not the nature of native cacti to grow fast. Professor Jaeger suggests that the slow ingress of carbon dioxide particularly in hot weather, is one reason. The natural growth of the natives comes in April and May—if there has been enough moisture. If by April there has been little rain or snow, it is advisable to approximate Nature's way by a heavy soaking the first of April and again in May.

I find the minimum requirements to keep a native of our own area in good condition (after there have been spring rains or that first of April and May waterings) is to soak once in June, July and August.

FEEDING

Not having either the time or money to force feed all my cacti, the majority have to get by with bone-meal once a year and a late fall mulch of manure—if I find the time to spread it. For the few specimens I wish to make a fine showing

and all those which should never have been planted in the first place, I give a weekly watering and a twice monthly feeding from June first through the second week in August. First the plant is soaked deeply, liquid fertilizer applied, allowed to sink in and then rewatered. For me the most satisfactory and cheapest form to use is one of those packaged powders intended for use dissolved in water.

Returning at last to Mr. Barney and his problem. He can have that fast growing cactus hedge on the high desert if he is willing and able to slavishly follow detailed instructions from one who learned (the hard way) how it can be done.

The cactus to use is *O. robusta*. It has very large pads which make it considered unsuitable for the high desert winters. Some one has said, "the nearly impossible we can do right now, the impossible will take a little longer." In this case, the "impossible" will not take too long as a satisfactory hedge can be grown in two years; and in three, one which will stop anything but a bulldozer. (If I can do it at 4000 feet, Mr. Barney can do it at 2000.) The trick is in maintaining a delicate balance between forcing growth with food and water and yet still getting the plant semi-dormant well in advance of the frost season. The first and possibly second winter, the plants will need some protection.

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SOME ODDITIES AND MALFORMATIONS IN ECHEVERIAS

By H. M. BUTTERFIELD, *Emeritus*

University of California, Berkeley

The horticulturist interested in succulent plants often looks for the unusual or some abnormal form that is attractive to growers and collectors. All readers are aware of the interest of cactus fanciers in crested forms. Crested forms are found in *Stapelia*, *Echeveria*, *Aeonium*, and various other succulents. Abnormalities extend to include proliferation, caruncles on leaves, and other oddities. The succulent fancier only becomes interested when such abnormalities are capable of propagation. A freak that cannot be propagated is of only passing interest. In order to better understand the nature of mutations that are sufficiently extraordinary to create wonder, we should first understand a few terms that are applied in describing such oddities.

Mutation refers to a sudden and permanent change in the normal in plants, and a plant form that has suddenly changed is often known as a sport. But the nature of the mutation or variation from normal is of direct interest to us. For more than 25 years we have been growing a form of *Echeveria gibbiflora* var. *metallica* known as *carunculata*. At certain stages of growth or under the right conditions, the larger leaves develop a caruncle or callosity on top. A *caruncle* in this case may be defined as an exposed fleshy protuberance or outgrowth. The deviation from normal might also be called a *callosity*, meaning a thickened area or raised area usually on the upper surface near the center of a leaf. The caruncle or callosity may vary from season to season as to



FIG. 7

Echeveria 'Blue Spur' developed by H. M. Butterfield about 1955. Plant is very proliferate. Photos by author.



FIG. 8. Echeveria 'Blue Spur' with leaves to show spur formation. Leaf at left also shows small caruncle.

outline and height and while leaves are very young in the early season there may be little or no evidence of the caruncle or callosity. Apparently the surface cells are involved in some way so that due to pressure beneath of other causes, the cells beneath the epidermal layer are pressed upward as the leaf grows until the caruncle is formed. Further study is needed to clearly show the real cause of such an abnormality. We suspect that the variation is inherited to some extent in the genus, *Echeveria*, since seedlings with the same characteristic have been produced on many occasions, especially in the *Echeveria* variety, *Carunculata*. The writer also found a chance seedling among a lot of seedlings of *Echeveria palmeri* Hort. (not the true *E. palmeri*) which had distinct caruncles on the leaves and since then this variety has been named Edna Spencer. This plant is stemless when young and even in age does not form a very long stem, whereas *Carunculata* does have a much longer stem and this is a fault in trying to keep a plant in exhibition form. Most *Echeverias* will in time develop a stem and by cutting off the top and rooting it we can save the top and expect some offsets on the old stub, all the way from one up to as many as a dozen small offsets, formed in spiral fashion around the stem on two sides.

A deviation from the common form of caruncle may be observed in a number of seedlings or descendants of *Echeveria* Edna Spencer grown by the writer. The caruncle may be long and narrow, or raised very high at times. The leaves of seedlings will also vary from the mother plant to give an interesting variety in form. Closely related to and obtained from this carunculate form is one that has been named, 'Blue Spur'. (See photo.) So far as the writer has observed,

this is the first variety introduced that has an actual spur-like growth on the leaves. The spur may be almost completely separated from the mother leaf or it may be attached part or most of the distance, as shown in the illustration. The spur is solid and seems to be closely related to the caruncle, since the leaves at times possess a caruncle as well as a spur. The spur often appears to originate at or near the base on the inside of the leaf so in that sense may be in some way related to the caruncle.

Readers should not mistake some extreme variation, such as a caruncle or spur, with more common appendages. A cusp or tooth is found at the tip of some *Echeveria* leaves, as on *E. cuspidata*, and on *E. gibbiflora* var. *metallica*. Some of the *Urbinia* group of *Echeverias* also have a very pointed tip on the leaves.

The variety of *Echeveria*, 'Blue Spur' mentioned above, has another abnormality and that is proliferation. A *proliferate* plant continues to produce new offsets or multiple buds which form more or less in rosette fashion and not in cristate form. 'Blue Spur' to date has never flowered and there is doubt if it will ever form flowers. It may be useful as a low border plant since it offsets so freely and is easy to propagate for that reason.

Still another oddity in leaf formation or growth of the *Echeveria* may be listed as *monstrous*. Instead of the stems and leaves being expanded in the usual form there is a noticeable shortening and curling of the leaves. This characteristic is retained when cuttings are rooted. How it compares with the monstrous form in some cacti has not been studied to my knowledge but it appears to be a mutation.

The *cresting* of a plant, as this term refers to succulents, is the formation of several fused

stems to produce a hand-shaped or *fasciated* growth. This flattened growth has been referred to as cockscomb in formation. Cresting and fasciation are the same. Some people believe this cresting is due to some injury but this may not always be true. It appears more often on a plant that has been having to struggle and the cresting on echeverias may disappear as rapid growth resumes. I have had a crested hybrid *Echeveria* revert completely to the normal form when given good growing conditions. Some crested *Echeverias*, such as *Echeveria subrigida* variety *palmeri*, seem to hold the crestation much better than other varieties. I usually have trouble about *Echeveria chihuahuensis* crest remaining completely crested. Repeatedly the crested form of *Echeveria agavoides* has reverted to normal. And I have been told by Mr. Eric Walther that *Echeveria crenulata* as we grow it in central California is a variety secured from a reversion to normal from a crested plant, though more than one *Echeveria* has been called *Echeveria crenulata*.

The cresting may develop rather suddenly in field- or garden-grown plants where adverse conditions appear. I have had at least three seedling *Echeverias* crest in the garden, yet none came from a crested parent, and none remained completely crested when given good growing conditions. Part of a plant would remain crested while another part would revert to normal. Most growers learn to keep the crested *Echeveria* rather crowded in the pot and refrain from stimulating the growth for fear of reversion. All reverted parts are removed to leave only the crested parts. Crested plants may be hard to keep in the best health when neglected so a reasonable amount of repotting will be in order, especially in such a form as *Echeveria subrigida*, variety *palmeri* crest. Reversion is found in some other crested forms besides *Echeveria*, such as cacti, *Euphorbia*, *Pachyphytum*, *Sedum*, *Stapelia*, and others. I have found cresting in *Euphorbia*

obesa hybrid seedlings. Close observation of many seedlings as they grow older will almost surely find an occasional specimen that is cresting. Treatment with colchicine or other chemical has not given much favorable response in cresting when used by the late Dr. Morgan of Richmond.

The oddities in formation of leaves and stems of *Echeveria* here mentioned include a caruncle or callosity (carunculate or callose form), crested or fasciated stems (usually known as a crest), monstrous form of growth (usually meaning a shortening of stem and possibly a distortion of leaf), and proliferation (meaning excessive production of new parts or offsets), and quite recently, a pointed extension of the leaf into a spur as shown in the illustration. Why such things suddenly happen in nature is hard to explain any more than we can explain any monstrous individual. If it were not for our ability to propagate vegetatively, some of these oddities would be lost. Certain forms of variation, such as formation of caruncles, seems to be carried over in the seed germ, as evidenced by seedlings also showing the oddity, although certainly not in simple Mendelian fashion in the case of Edna Spencer. The writer has now been studying carunculation in *Echeveria* for many years and has a good many carunculate seedlings of various forms. While it is as yet impossible to predict when carunculate seedlings will appear, still experience clearly shows that the oddity is carried over to seedlings at times and perhaps often enough to greatly interest breeders. The horticulturist will await the results and base his appraisal of such seedlings on their beauty as well as their oddity. An oddity is not always beautiful and this can apply to a carunculate *Echeveria* at times. Even more important will be the color and form as well as size of the offspring. Possibly other forms of oddities will appear in time.

REMARKABLE CACTI

"All flesh is grass," says the Bible. And science agrees.

If it were not for photosynthesis—the mysterious process whereby plants convert carbon dioxide, water and sunlight into carbohydrates, fats, proteins and other complex molecules of life, animal life could not survive on this planet. Remarkable discoveries about this photosynthetic process have been turned up recently by scientists at the University of Southern California. Desert plants, according to the SC biochemist Dr. Paul Saltman, use an ingenious system whereby they

"work at night" to accomplish a part of the photosynthetic procedure that would be impossible during the blinding heat of the day.

"A plant leaf," explained Saltman, "is dotted by minuscule 'stomata', or 'pores' through which they absorb the carbon dioxide, oxygen and water that they will eventually convert into sugars. In the case of plants in arid regions, however, the mere act of opening these pores would result in a tremendous loss of water making the photosynthetic process impossible. But succulents and cacti lick this problem. We've just discovered

that great quantities of carbon dioxide which are absorbed by these plants during the night are stored up and eventually converted into sugars during the light of day."

The discovery was made possible by tracing the progress of radio-active carbon dioxide through the systems of various desert plants.

According to Saltman, the 'food' produced by these succulents and cacti at night is not the usual 'sugar' product of plants that work on the day shift. Rather, at night they build amino acids—the building block of protein structures—and organic acids, such as the sour-tasting acid found in citrus fruits.

But, according to the SC biochemist, these amino and organic acids are used as "store-houses" for the great quantities of carbon dioxide that have been absorbed at night and which during the daylight will then be converted into sugars.

"All plants absorb and store some carbon dioxide during the night," said Saltman, "but never before did we know that plants could store and utilize such tremendous quantities as do these desert growths. It's quite remarkable."

QUESTIONS and ANSWERS

Conducted by
HARRY JOHNSON
Paramount, Calif.



Question: My Pink Crown (*Rebutia violacea*) has some sprouts. When you take the cuttings do you put them in soil right away and do they take root and grow?

MRS. OVA PARSON, Kansas

Answer: The cuttings may be rooted. Be sure that when you take them off to use a narrow bladed knife and cut them loose just where they join the mother plant. This way the cut surface is very small consisting mainly of vascular tissue. The roots always arise from this vascular tissue and never from the water storage parenchymatous tissue.

My method is to allow the cuttings quite a long drying period before planting. When a cutting is made the plant suffers a shock as it receives no more water or various chemicals it needs for growth. It continues however to manufacture food which moves down toward the base. As it collects it stimulates the formation of roots. It is obvious this is not going to happen in a day or so. Thus to plant the cutting at once will be no

gain. In ordinary garden plants where there is little water storage tissue, the cuttings must be kept moist and should be planted at once so wilting will not occur. The reverse is true with cacti and many succulents because they have sufficient stored water and thus do not wilt.

The cut surface can be dipped in sulphur or in a rooting powder. Place cuttings in a dry, partly shady place that has a free circulation of air. A close atmosphere may induce rot. After a week the cuts may be placed on dry sand or peatmoss. In three or four weeks roots may show. Much depends on the time of year. Bottom heat in cold weather helps; if used, 70 to 80 degrees is ample. After the roots show, the cuttings may be planted shallowly in your regular compost. If you are inclined to overwater plant them in coarse sand and leafmold until well rooted. Keep barely damp until the roots take hold. Some cuttings may take as long as two years to root while others will root in a few weeks. The above method is safe for almost any cactus cutting. Many of course will root without any particular care if not over watered. If you are not familiar with the plant it is better to err on the safe side than be sorry.

* * *

Question: Is it all right to set cacti in pots outdoors during the summer regardless of rain? My plants are Mexican or Arizona specimens. I have searched through libraries to find the name of a plant I found in Arizona. It is pale yellow or faded green and very spiny with branches. Plant is a foot tall. Do cacti like their roots compact in a pot? I have seen them in small pots doing well. Should cacti be dormant in winter? How come people keep them in sunny windows all winter? Mine try to grow and small growths drop off.

MRS. G. HOPKINS,
Pittsburgh, Pa.

Answer: Quite a number of cacti will take the summer rains of Pennsylvania. However many of the Mexican and Arizona cacti would not be too happy during long rainy spells. Such things as *Lobivia*, *Rebutia*, *Echinopsis*, some *Parodias*, *Notocacti* and some *Cerei* would probably do quite well. The pale yellow branched cactus from Arizona is *Opuntia*, quite likely *O. bigelovii*. Many cacti will grow very well in small pots. However after the pots are full of roots there is hardly any nourishment left for them. If at all possible, they should be shifted on into the next size pot. Many believe by having plants pot-bound, they will flower better. This is true if plants are grown without enough sun and fresh air and with too much water. If given fresh air and sunlight they will do better with a richer soil and more root room.

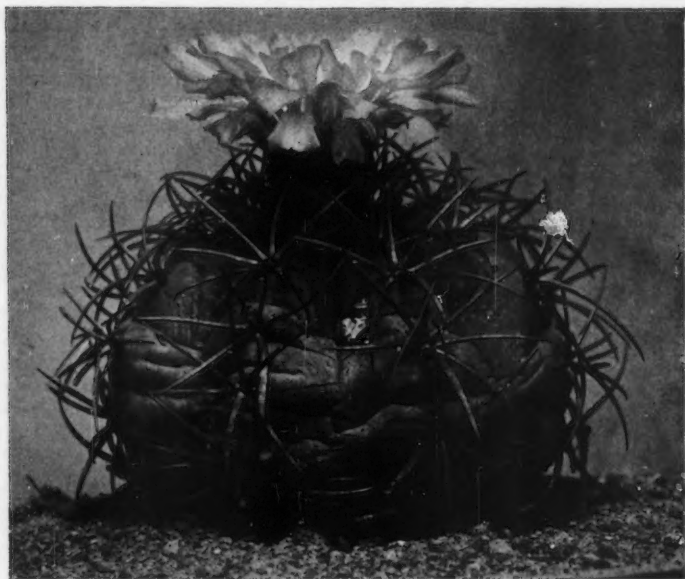


FIG. 9. *Echinocactus horizonthalonius*

A COLLECTING TRIP IN THE BIG BEND COUNTRY

By W. H. DAVIS

(Photos from "Texas Cacti")

After a steady downpour of rain, with our spirits slightly dampened, my wife and I left for the Big Bend Country of Texas on April 22, 1957 at 5:00 A.M. We were hoping it would fair off which it did a little further on. We left from Kerrville, Texas on Highway 27 to Junction with no stops in between because we had already explored the country for cacti. From Junction we turned west on Highway 290 to Sonora with several stops along the way. About fifteen miles we stopped and collected a long-spined *Echinocereus enneacanthus* which are very scarce around Kerrville. Here we also collected *Mammillaria meiacantha* which is common but very scarce around Kerrville. A little further on we collected three specimens of *Mammillaria denudata* which I had never seen. I knew it wasn't the *Epithelantha micromeris* because of the central spine. I couldn't classify it until I was back in the car and with my book of "Texas Cacti". We also collected some *Neobesseya wismanii* at some place along this route.

We stayed on Highway 290 to Ozona with one or two stops in between. At the head of the Devils River we collected a specimen of *Opuntia*

strigil which is considered a rare plant but it was growing all over the hillsides in this particular area. We also collected one specimen of *Echinocereus conoideus* that I didn't have. It was severely bruised by hail and not a very good specimen.

We continued on Highway 290 from Ozona to Fort Stockton with about a dozen stops in between. The first stop was about one mile out of Ozona where we collected *Opuntia kleiniae* and somebody got kinda smart with me until we told him what we were doing on his property. He then said we could get all we wanted of those chollas, that he didn't want anything to do with them. The man didn't know a cholla from a prickly pear. Just because it had round or terete stems he thought it was the so-called jumping cholla. But we soon made staunch friends and were invited up to his house for something cold to drink. He had an artesian well on his place that was bubbling out of the ground. Boy, was that water good, cold as ice and good as candy. Why we drank so much that we nearly made ourselves sick. We even poured out the water that we had brought from Kerrville and refilled our

jugs with his. We talked about thirty minutes about his sheep that were so fat they could hardly walk.

Our next stop was at the old Tuna Springs Stage Coach Depot where we collected specimens of *Echinocereus stramineus*. The next stop brought us to a Road Side Park on the Pecos River valley. We took some pictures of the valley with the blue haze over it which was too beautiful to be described in words. Here we collected several specimens of *Echinocereus roetteri*, which were very beautiful with pale pink blooms the size of saucers. Down in the Pecos valley we collected an odd shaped cactus with curved central spines that were two inches long and very weak, surrounded by eight radials about half as long and equally as weak. The tubercles were as long as *Coryphantha macromeris* but the groove began about half way down instead of beginning at the

spine cluster as *C. macromeris*. It is definitely of the *Coryphantha* group though. I haven't as yet classified it. We also collected some nice specimens of *Echinocactus horizontalis* which were the first seen on this trip.

At the next stop we collected specimens of *E. horizontalis* and one specimen of *Coryphantha neo-mexicana*. We didn't stay long at this stop because of a severe dust storm that came up. Just imagine about three hundred miles from the rainy weather and here it was so dry I was scared to light my pipe. That's Texas though; old timers say if you don't have the right kind of weather in Texas just wait fifteen minutes. The dust was so thick it took us three hours to drive the twenty miles into Fort Stockton. We stopped at the Circle H Motel and parked the car and went in and took a shower. About an hour later we went to get something out of the car and it was cov-

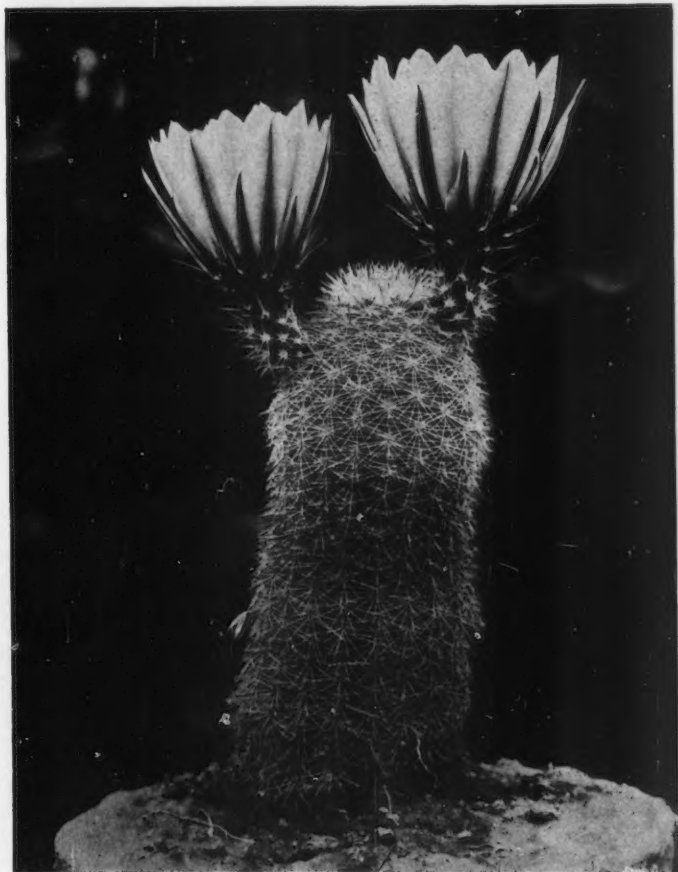
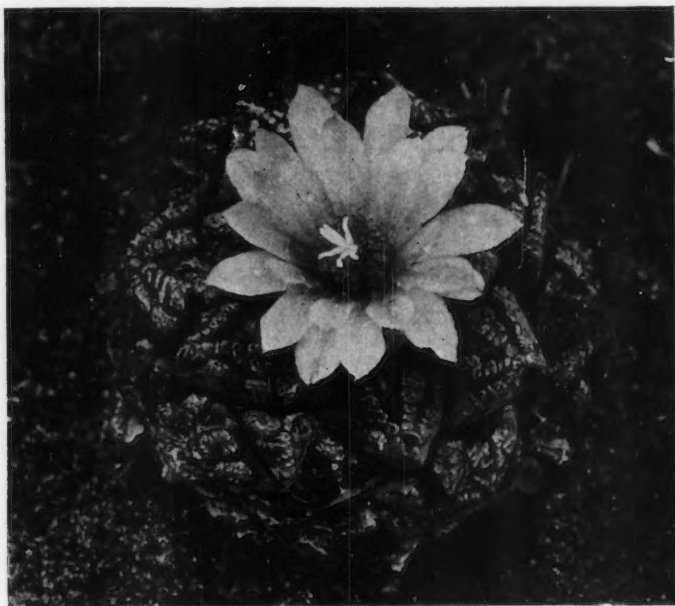


FIG. 10. *Echinocereus dsayacanthus*

FIG. 11. *Ariocarpus fissuratus*

ered with dust about two inches deep inside and out but the wind was laying. This was about four o'clock, so we ate supper because we hadn't taken time to eat lunch. Naturally it was full of grit and dirt but it was good.

The next morning it was clear and pretty so we got up early and put a low pressure thermostat on my car because we were in hilly country. We left Fort Stockton about 8:00 and proceeded along Highway 290 for nine miles and took Highway 67 into Alpine with several stops along the way. At the stops we collected *Echinocereus dasyacanthus* and *E. viridiflorus*. We arrived at Alpine at ten o'clock. We went to Mr. and Mrs. Cliffords, a friend of ours, and they persuaded us to stay with them while we were in Alpine. Mrs. Clifford said she knew where there were some "Star Cactus" *Ariocarpus fissuratus*, and we said let's go. We went out on Highway 118 toward the Big Bend National Park for thirty miles. Here on top of a mountain 4050 feet above sea level, we found *Ariocarpus fissuratus* by the thousands. The other cacti collected were *Echinomastus dasyacantha*, *Mammillaria beyderi*, and *Echinocereus chloranthus*. Of course we collected some *Ariocarpus fissuratus* also. We got back to Alpine at 5:00 P.M. When Mr. Clifford came in from work we went to get some more *Mammillaria beyderi* that had fruits on them. This was about two miles out of Alpine on Highway 90.

The next morning we went north on Highway 118 to Fort Davis and McDonald Observatory which was 7890 feet above sea level. On the slope we collected a variety of *Opuntia kleiniae*. The stems on this *Opuntia* were larger than the *leptocaulis* and smaller than the *kleiniae*. Cacti in this area are nearly gone because of the severe drought for the past eight years. On the Observatory grounds were *O. leptocaulis* and *O. lindheimeri*. We stayed here about an hour and made the loop on Highway 166 back to Fort Davis. On the way to Fort Davis from Alpine we followed an old Stage Coach route with the old adobe depots still visible. At the old Fort Davis we stopped at Indian Emily's grave, the brave Indian girl that was going to notify the Fort of an attack by the Indians. A sentry shot her and she was buried at the place she fell. Before her death she told of her love for an officer of the Fort and of the impending attack of her braves. She saved the Fort from annihilation by the Indians. This was very interesting. The old Fort is under the protection of the Texas Highway Department. We ate lunch at the Indian Lodge about nine miles on Highway 118 at the Indian Lodge Park which is very beautiful.

When we returned to Alpine we stopped to visit the Big Bend Cactus Co. and meet the owner Mr. George Pugh who made us a present of one specimen of *Peniocereus greggii* with six buds ready to open. This is one of the rare cacti in

Texas. We were very proud of it and we literally carried it in our hands all the way home, so as not to injure those precious buds. He also made us a present of a number of *Epithelantha micromeris*, *Ferocactus uncinatus*, *Echinomastus intertextus*, *E. dasyacanthus*, *Thelocactus bicolor*, *Nelloydia texensis*, *Coryphantha muehlenfordii*, *Escobaria tuberculosa*, *E. dasyacantha*, *E. sneedii*, and *Mammillaria heyderi*. Mr. Pugh was a very interesting person to talk to. He told us some very interesting experiences with cacti.

The next morning we left about 6:00 A.M. for Big Bend Park, our destination. We left on Highway 118 on a hundred-and-two-mile trip. Of course we made several stops along this lonesome route. At the first stop we collected *Opuntia schottii*, *O. grahamii*, *O. davisii*, *Coryphantha macromeris*, *Echinocereus dubius*. We arrived at the park about 11:00 A.M., and received information as to the conditions in the park from the Park Ranger. We told him about the cacti we had collected so he wouldn't think we collected them in the park which is against the law. He was very nice and friendly so we talked about an hour and went on a park road to Santa Elana Canyon where we ate lunch. The canyon walls are 2145 feet high where the Rio Grande separates Mexico from Texas. We stayed about two hours and took

pictures. We drove to Castalon which is seven miles over one of the roughest roads in history I believe. Castalon is a privately owned town in the Park area. The Mexicans were planting cotton in a valley of the Rio Grande. They really had a long trip to take the cotton to the gin. They either had to take it to a gin in Mexico or one in Alpine which is about equal distance. We had cokes at the store which were cold. I asked the storekeeper how hot it got there and he said 106-108 degrees and sometimes much hotter. We stayed about an hour taking pictures.

From Castalon we backtracked to the main Highway 118 and started to Hot Springs and Boquillas Canyon but to our great disappointment they were fixing the road for paving and we had to turn back. We didn't go into the Basin because we were pushed for time and we went there last June. The Chisos Mountains were beautiful around the Basin and they are 6060 feet above sea level. We left on Highway 227 for Marathon, Texas. We arrived at Marathon at 6:00 P.M. Just outside the park we saw somebody else collecting cacti. When we got to Marathon we rented a Motel and ate supper. We went to mail a letter and when we got back to our motel we saw a pickup truck there loaded with cacti. We said you have been doing the same



FIG. 12. *Ariocarpus fissuratus* is hard to find

thing we were doing. We introduced ourselves and they did likewise. They were the owners of the J. and J. Cactus Gardens at Natalia, Texas, Mr. Jesse Thomson and Mr. Jack Broxton. We exchanged cacti and talked until the wee hours of the morning. They were headed to Natalia with a truck load of cactus, and we were headed to Kerrville with our '51 Olds. loaded. We got to bed about 1:30 A.M. We were up bright and early the next morning, rested and headed for home, with the grandest treasure of them all, the fellowship and friends of cactophiles.

We left Marathon at about 6:30 A.M. on Highway 90 for Sanderson. It started raining on us about twenty miles out of Marathon and rained on us all the way to Kerrville. Continuing on Highway 90 we stopped at Langtry, the home of Judge Roy Bean and the Law West of the Pecos. Some pictures were taken although it was raining cats and dogs. Our stops were few and no more cacti collected because of the downpours of rain along the way. We did stop at the mouth of the Pecos River which affords a beautiful view

even on rainy days. Here some more pictures were taken.

We stopped at Uvalde for gas and continued on Highway 83 to Leakey and then on Highway 39 into Kerrville. We arrived at Kerrville shortly after a flood of 4.60 inches. Again our spirits were dampened but we were happy to be home. We arrived at home at 5:00 P.M.

We've talked about cacti all the way through the trip and the other wild flowers should be at least mentioned. The hills and fields were beautiful although it rained on us all the way to twenty miles from Fort Stockton on our way out and all the way back from Marathon, but it was as dry as a powder house in the Big Bend of Texas. Some of the wild flowers observed along the way were *Verbena bipinnatifida*, *Castilleja lindheimeri*, *Penstemon cobaea*, *Gaura paviflora*, *Pblox drummondii*, *Gilia rubra*, *Engelmannia pinnatifida*, *Aphanostophus skirrobasis*, *Lupinus texensis*, *Fouquiera splendens*, *Calliandra eriophylla*, and *Prosopis juliflora*. These as well as the cacti blooms made the hills and fields a thing of beauty.



FIG. 13

A non-professional exhibit 10x10 feet at the Ninth District Fair at Eureka, California. It won a first prize for Mrs. Joseph P. Cruz, 2316 Alliance Rd., Arcata, California.

DESERT FLOWERS UNDER GLASS

The story of my experiences and delight in growing and flowering Cacti and Succulents in a small glasshouse in Christchurch, New Zealand

By MARJORIE E. SHIELDS

CHAPTER 5, Continued

Spring at last! After a dreary, cold, sunless July, August awoke to the song of the birds, and the breath of spring has stirred plants into growth. So let us see what it has done in the Mesembryanthemum corner. Why! The *Cheiridopsis* are in flower. Don't they look gay! This one with the long stems is *C. summitata*; the yellow daisy-like flowers making a splendid show as there are so many of them in flower. *C. umdausensis*, found at Umदाus, S. Africa, tucks its blossom well down into the cleft between each leaf pair. These blooms are a little larger than the former and are definitely much paler in colour, being almost silvery.

This beautiful one is *C. candidissima*, living

up to its name "white, shining and brilliant," for its long finger-like leaves are well powdered with white and the flowers are certainly both shining and brilliant. See among the long leaves, the shorter, wider ones, toothed around the edges? Most attractive, aren't they? When the flowers first open they are a delicate pink, shading to cream towards the centre and look gorgeous against the powdery blue-white foliage. Later they change to biscuit, losing the pink flush. However, the change in no way detracts from their beauty. *C. pillansii* beside it has yet to flower, but I believe it too has great claims to beauty. *C. purpurascens* var. *leipoldtii* was disappointing. I expected a purple flower, but it was yellow.

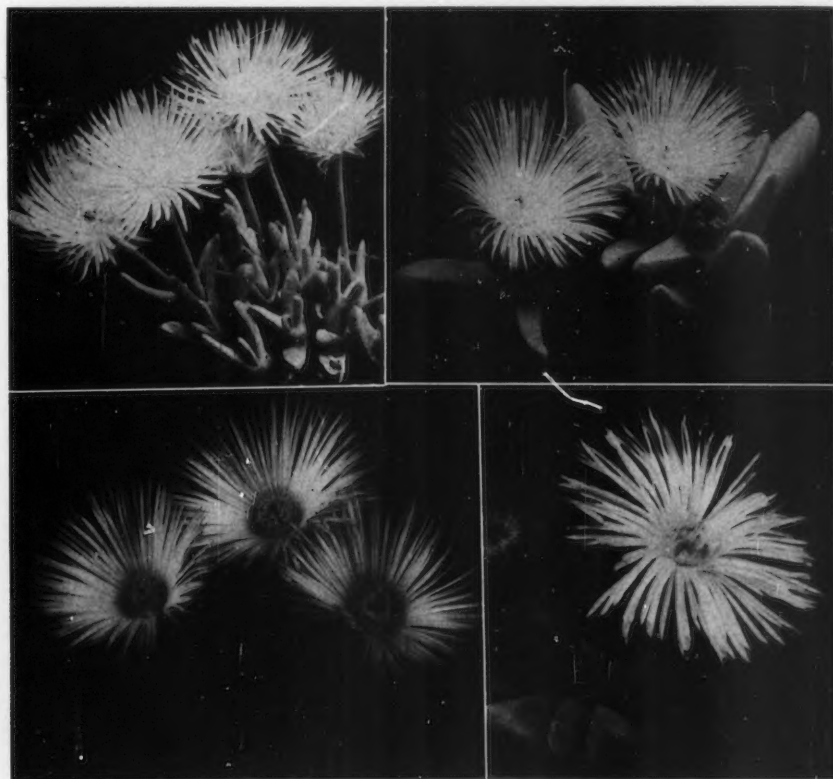


FIG. 14. *Cheiridopsis summitata* (upper left). *C. umdausensis* (upper right). *C. candidissima* (lower left). *C. gibbosa* (lower right).

This one looking rather like an *Argyroderma* or a *Dinteranthus* with its squat fat leaves, is *C. gibbosa*, meaning "humped." It also has a beautiful blossom, opening pale yellow then fading to white. Hold a plant up to the light. Any one will do. See how the spotted leaves are full of tiny windows? Aren't they amazing? Like the rest of the plants in this corner, *Cheiridopsis* come from S. Africa and are found in Great and Little Namaqualand, as well as in the Karroo Deserts. As they flower in early spring here in N.Z., they need a different watering programme from the autumn flowering plants. They have their growing period from late summer onwards until they bloom, during which time they must be watered, but in the winter do so only when a slight shrivelling is noticed, choosing a sunny day if possible. After flowering, in the spring, give no more water until about December, (N.Z. mid-summer)—the plants will tell you when. Just the reverse procedure as given for the autumn flowers.

Some of the *Gibbaeums* need exactly the same treatment, but unfortunately they do not all flower at the same time. Some of mine have not flowered at all yet, simply because I do not

know their blossoming period, and am probably watering and keeping dry at the wrong times. It is a good idea when a plant does flower to write the date on the label so there will be no mistake when it comes to future waterings.

Early spring, August, has called to three of them, and here they are decked with flowers in different shades of purple. *G. perviride* as its name says, is "entirely green." It IS a queer plant! Being a *Gibbaeum* it has its leaf pairs in different lengths—a short and a long one. The sun has caught the latter and coloured it faintly purple to match the little flowers which are only 3/4 of an inch across. The petals are of irregular lengths, pale purple shading to almost white, with a deeper purple mid rib. The flower is very dainty as the petals do not lie flat, some being incurved, others recurved, while still others are twisted. It looks a little untidy as though it has forgotten to brush its hair.

G. shandii is about the length and thickness of your thumb, and if you can imagine someone with a sharp knife making a large slit in it below the knuckle, leaving a gaping wound, then you will have some idea of the queer shape of this *Gibbaeum*. I am sorry if the description offends

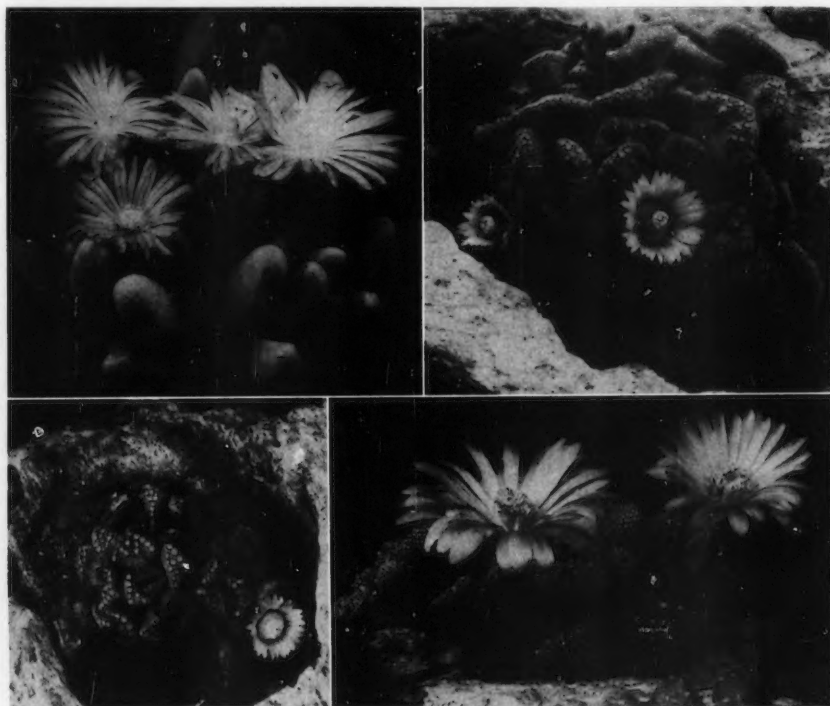


FIG. 15. *Gibbaeum fissoides* (upper left). *Titanopsis* (upper right). *T. schwantesii* (lower left). *T. luehmannii* (lower right).

but how else can I describe it, with its one long leaf and its shorter one pressed closely against it, just opening at the top to let its pale purplish flower through. *G. fissoides**—"a cleft," also has long leaves, narrow and finger-like, but the difference in their lengths is not as apparent. The flower which is much larger, being 1 1/2 inches across is bright clear violet with no shading and no mid rib. It has pale mauve filaments with pale fawn anthers.

In September, *G. pubescens* blossoms. This is a very charming plant with light purple flowers, pink filaments and cream anthers. The leaf pairs, though similar to *G. shandii*, are more numerous, very much smaller and thinner. This plant eventually makes a clump. The leaves are almost white, being thickly covered with meal and "downy" as its name implies. In its natural habitat it is always found among white stones and when its little purple flowers appear it must make a lovely sight. *G. comptonii* is really beautiful with its body a closed split green pebble lightly powdered, opening just a little to let the lovely rosy purple blossom through. What a large flower it is too! The colouring of both this plant and its bloom are exquisite.

October brings us *G. petrense*, also known as *Argeta petrensis*. Doesn't it look intriguing with its little purple flowers protruding from its split leaves? One flower to each leaf pair approximately. These leaves are so small the difference in size of the two is hardly discernable. It has formed quite a clump. Next to it is *G. heathii* sometimes called *Rimaria heathii*. It also blooms in October with much larger flowers and is a different shaped plant altogether, with leaf pairs about the size of a walnut, which open to let the pure white flower through. Quite a contrast from the purple ones isn't it? As these are all spring flowering plants, they need the same watering programme. But this little one wrapped up in the green fur coat to keep it warm, flowers in June—the middle of winter. No wonder it needs a fur coat! Its name is *G. pilosulum* and means "hairy with soft, slender hairs". It really looks rather like a cluster of green gooseberries doesn't it, with a little purple flower on top, instead of the usual dried calyx.

Now let us find some of the others belonging to this Mesembryanthemum group. They will be hanging from the glassbars and posts or popped in here and there wherever there is room for a container. These are not like split pebbles, even though some are more or less mimicry plants. The *Titanopsis* for instance, imitate the limestone rocks amongst which they grow. Not being able to find any limestone for their home I scooped out some pockets in this large boulder

of pumice instead, there they look perfectly at home. These plants have triangular leaves, the flattened tops of which are three cornered and covered with tiny tubercles. Plenty of lime is necessary in their soil and when watering, care must be taken not to water between the leaves as this encourages rot; they are given no water at all during the winter. Sometimes they will flower in the autumn, but their main blossoming time is spring—September and October.

Here they are right in the front, their boulder resting in the angle of the two benches. There are seven pockets in this piece of pumice, five of which are occupied by these beautiful little plants, and I hope before long the other two will house *Titanopsis* too. And look! Four of them are in flower! *T. schwantesii* is a very pink plant; pink pin head sized knobs cover the flat triangular tops of the leaves, and the pink flower shades to cream towards the centre. The flattened leaf tops of *T. calcarea* are covered with reddish gray to white knobs and it has a golden flower. The name tells us where to grow it, as it means "growing in limestone places".

T. luckhoffii has its triangular top decorated with pale green or white knobs shading to pink, with pale pink teeth round the edges. The yellow ochre flowers held by a short stalk are a little bigger than the previous two. The tops of the leaves of *T. setifera* are covered with pale green knobs and edged with tiny teeth also, hence its name "bearing bristles or teeth". The salmon pink flowers also have short stalks. The flowers of both *T. schwantesii* and *T. calcarea* nestle into the plant with no apparent stalk. Instead of the stamens spreading like a pompom, in these two latter flowers, they rise from a wide base up to a point. Imagine a small button with a tiny pyramid sitting in its centre, then some idea will be gained of what these flowers are like. These plants, complete with their lovely blossoms are little jewels, full of beautiful colours and of unusual attractiveness. They do seem happy in their pumice boulder home.

In the other two pockets are the little *Stomatiums*: *fulleri*, and *S. ermininum*, both with prettily shaped leaves, narrow at the base, then widening. As the backs of the leaves are so much fuller than the front, from side view they look like monk's hoods, with a little frilling round the face, which in reality are tiny teeth. They are also roughened with many tiny transparent spots. *S. fulleri* is grass green and *S. ermininum* gray green. They seem to flower more or less all the year round, opening about four o'clock in the afternoon, and remaining open well into the night. The little fluffy blossoms are like tiny powder puffs or silken tassels so fine are the petals, the knot of stamens in the centre just

**Gibbaeum nelii*.

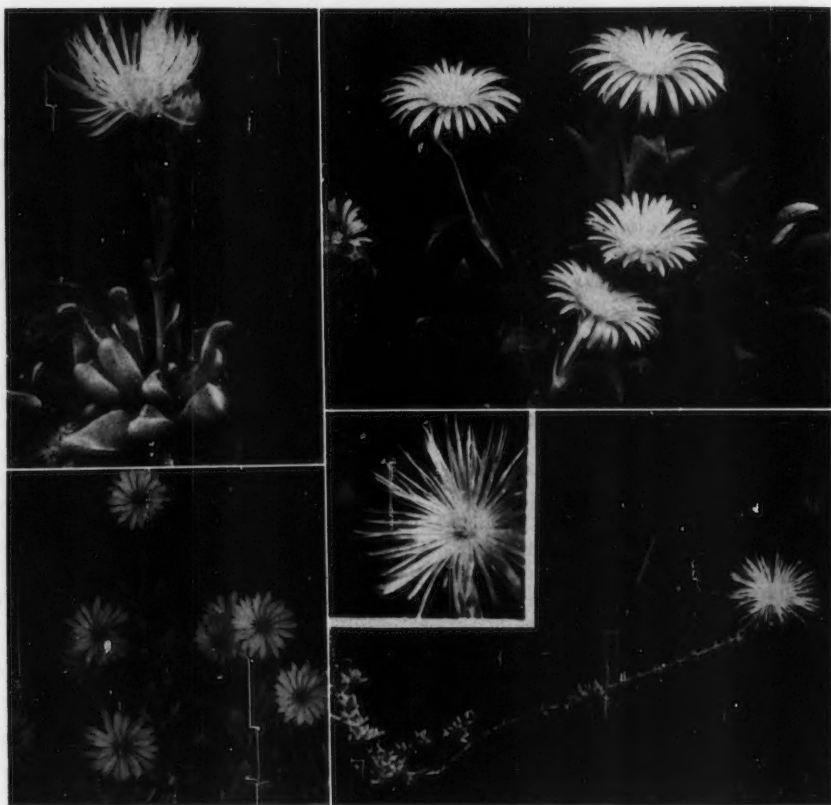


FIG. 16. *Rhombophyllum rhomboideum* (upper left). *Delosperma sutherlandii* (upper right). *Erepisia inclaudens* (lower left). *Aridaria pentagona* (lower right).

flattening them a little. *S. fulleri* is the paler of the two, but *S. ermininum* is sweetly scented.

Here is *Carruanthus caninus* with orange flowers on longish stems making quite a good display with its showy little flowers. *Rhombophyllum rhomboideum* with its "top-shaped leaf" has very pretty yellow flowers with incurved petals, two or three blossoms branching from the main stem.

October is the month for the shrubby Mesembryanthemums to flower. On the whole they don't flourish in the glasshouse, and would be much better outside in a rock garden, but as I have no suitable place for them they have to make the best of their unnatural surroundings. Some of them are very pretty. Look at the lovely flowers on *Aridaria pentagona*, two inches across, cream on the inside, pale orange on the reverse. The petals are very fine and uneven in length. If it were not for the anthers it would be hard to tell where the petals end and the stamens begin, because of their similarity both in colouring

and in form. The foliage is attractive too. The long branchy trails of orange and pale green jelly-bean-like leaves, "five angled" according to its name, are most artistic. Altogether it is an attractive, dainty and colourful plant.

In the tin next to it, *Drosanthemum speciosum* has very bright shining orange daisies with green centres. Isn't it a "showy" little daisy? Doing its best to live up to its name. With the sun shining on it the colour is so bright it almost hurts one's eyes. It is not quite as large as the *Aridaris* nor is the foliage as gay; never-the-less it is well worth growing.

Delosperma next demands our attention. *D. sutherlandii* is a small unbranched plant with dark green, hairy foliage in the form of a loose rosette. The bright purple daisy-like flowers with petals of uneven lengths, have short white ray petals in the centre as well as the yellow stamens. It is a lovely blossom with always several out at once.

November brings us *Erepisia inclaudens*, a

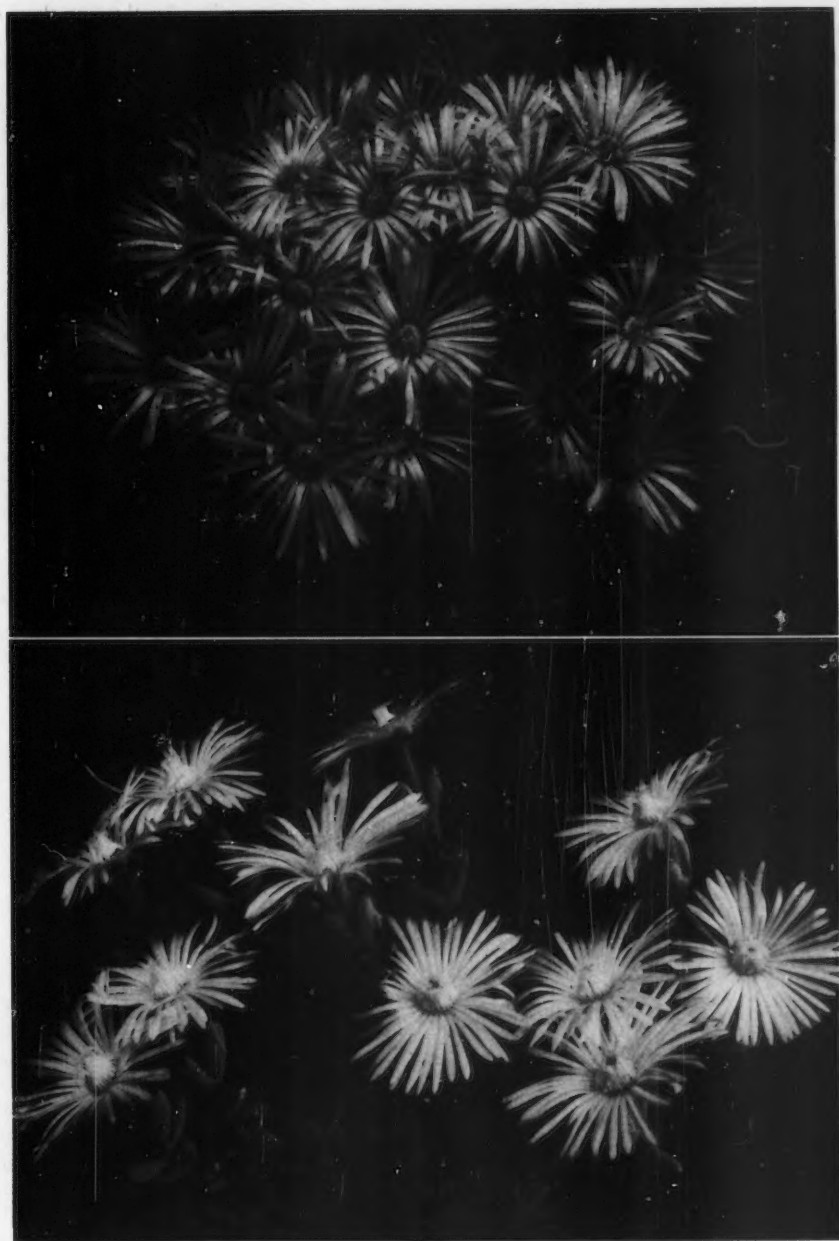


FIG. 17. *Trichodiadema densum* (upper). *T. stellatum* (lower).

delightful branching plant which smothers itself with bright purple flowers with the tiniest purple centres to match. As its name tells us "they do not close". It makes a most attractive plant for the window sill, for it is like a little tree, and flowers as well inside as it does in the glasshouse. *Schwantesia triebneri* is a little stemless plant—something like the *Stomatiums*—a little larger perhaps. It also forms a clump and has most attractive foliage and yellow flowers.

Trichodiadema completes this group. *T. stelligerum* flowering in November, *T. stellatum* in the autumn and *T. densum*, which is much the best one covers itself with blossoms in mid winter. These three all have purple flowers and similar foliage—jelly-bean like leaves crowned with a circle of bristles. But there the resemblance stops, for *T. stelligerum* is trailing, *T. stellatum* has upright growth and *T. densum* is a dense clump with no apparent stems. They are there of course, but so short and so thickly covered with leaves as to be unnoticeable. As I said before this one is the most attractive and does best in the glasshouse, but the other two are better outside on the rockery, weather permitting.

There used to be many more of these shrubby

plants here but experience taught me that the glasshouse was no place for them so they were given to an enthusiast who has a cliff garden by the sea. Here they revel in the heat and instead of being miserable specimens are now huge clumps, feet across, and perfectly dazzling in the bright sunshine with their pink, yellow, purple and red flowers all aglow.

This corner, though of interest to many, will probably weary some readers, so next time, to the *Mammillarias*, where there will be something of interest for everyone.

ALOE OF SOUTH AFRICA—Reynolds

This fine monograph of 542 pages contains descriptions of 132 South African Aloes with 572 illustrations and 75 color plates. The keys and text are presented in an understandable manner. Cloth, \$11.85

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—Olin and Cannon

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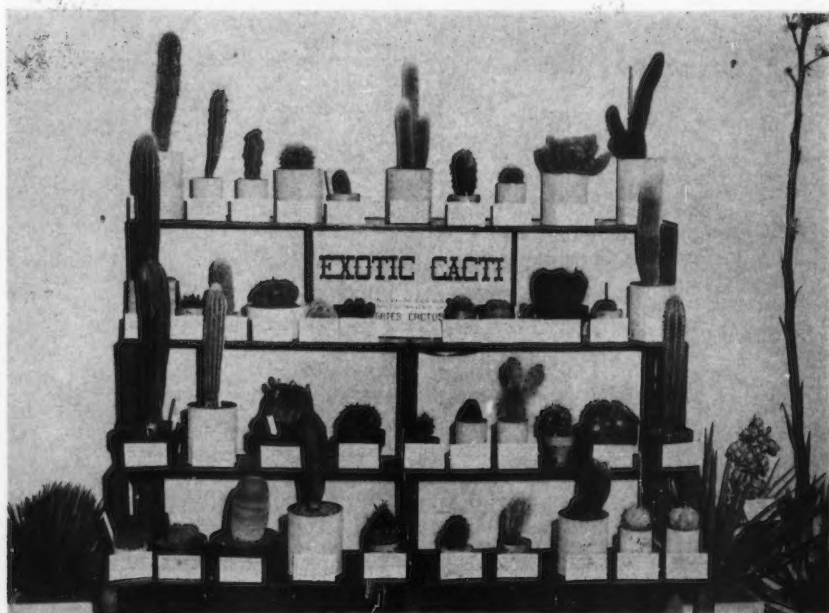


FIG. 18. A living cactus exhibit at the Natural History Museum in Balboa Park, San Diego, California.

Many of the plants came from the collection of the late Howard Gates. On the opposite wall from this exhibit are shown the succulent plants from San Diego County.

Courtesy Dr. George Lindsay, Executive Director.

ICONES PLANTARUM SUCCULENTARUM

11. *Epiphyllum cartagense* (Weber) Britton et Rose¹

By MYRON KIMNACH

Epiphyllum cartagense (Weber) Britton & Rose is one of the most distinct species of the genus, but it has been inadequately studied and published information concerning it is brief. Wercklé² stated that near Cartago, Costa Rica, it "grows in dense tangles with beautiful bromeliads, epiphytic ferns, aroids and orchids." C. H. Lankester of Cartago, who sent us the plant figured and described here, writes us that the species "is still fairly common around Cartago. My specimen was found wild in my garden, as it still grows on the rocks in the coffee areas, especially near the river Agua Caliente, where it climbs about on *Pithecolobium* [*Leguminosae*] and if undisturbed forms immense, interlocking masses of stems."

Weber³ remarked that the fruit was edible and in Costa Rica was called "Platanillo de Monte" (little plantain of the forest). Mr. Lankester, resident in that country for over 50 years, comments that he has never heard this name and that it was probably obtained from a native who did not know of a popular name for the species and who therefore obliged with what came into his mind. However, he adds that knowledge of the native names of plants is vanishing rapidly.

Weber³ listed collections by Wercklé, in the vicinity of Cartago, altitude 1400 m., year unknown (but after 1890, the year of Wercklé's arrival in Costa Rica), and by Tonduz, at Car-

tago in 1898. However, the earliest collection known was by A. Alfaro at San José in 1887; this material, consisting of a sectioned flower, is deposited in the U.S. National Herbarium and bears a determination label of Karl Schumann annotated "*Phyllocactus costaricensis* Web.?" even though the pericarpel of the flower lacks the bristles of that species⁴ and the zone of staminal insertion is typical of *E. cartagense*.

Polymorphism in this species has been noted several times. Weber³ established a variety for a plant with reflexed tepals, and Wercklé² briefly described a particularly robust variety⁵ that grew in "several regions of the Candelaria range." Wercklé² also remarked that the species showed "a striking variation in the color of the outer perianth segments and tube: carmine-rose, copper, dirty gamboge-yellow, brownish green, etc.; the inner segments, however, are always white." Britton and Rose⁶ stated that the species was "apparently composed of several races, differing in margins of the joints, in size of flowers, and in color of style," but it is not known on what evidence they based these conclusions. We were unable to discern significant variation among the specimens cited below, although such variation may not have been adequately preserved. Although the published varieties seem unworthy of recognition, it is possible that field studies may eventually require varietal status for some of the more distinct populations.

Epiphyllum cartagense (Weber) Britton & Rose, Contr. U.S. Nat. Herb. 16: 256, 1913.

Phyllocactus cartagensis Weber, Bull. Mus. Hist. Nat. Paris 8: 462, 1902.

Phyllocactus cartagensis var. *refractus* Weber, l.c.

Phyllocactus cartagensis var. *robustus* Wercklé, Monatsschr. für Kakteenk. 15: 180, 1905.

Plant forming thickets of erect, arched or pendent stems; *primary stems* up to ca. 20 dm. long, the basal portions trigonous to subterete, ca. 15 dm. long, 5 to 12 mm. in diameter, often with copious aerial roots, with 3 rows of low, obtuse to subacute podaria, the leaves ovate, obtuse, less than 1 mm. long, the areoles 4 to 12 cm. apart, increasingly approximate apically,

spines and hairs lacking, the stems then becoming abruptly 3-winged for up to 40 cm., the wings up to 2 cm. wide, the stems finally flat-

1. University of California Botanical Garden, Berkeley, Contribution Number 148.
2. Monatsschr. für Kakteenk. 15:179-180, 1905.
3. Bull. Mus. Hist. Nat. Paris 8:462, 1902.

4. Although *E. costaricense* (Web.) Britt. & Rose is usually considered synonymous with *E. macropterum* (Lem.) Britt. & Rose, our studies of living and dried material show it to be a distinct species; it will be treated later in this series.
5. Weber is always cited as author for this variety, but it was first described in Wercklé's article without mention of Weber's name.
6. Cactaceae 4:197, 1923.

tened in the apical 3 to 15 cm., ca. 5 cm. wide, the lobes 3 to 6 cm. long, usually semi-orbicular, rarely nearly straight, the areoles at base of sinus; *secondary stems* arising from the upper part of the terete or winged portions of the primaries, nearly at right angles, usually arranged in three rows, the portion near base subterete, trigonous, or nearly flattened, 3 (1 to 8) cm. long, ca. 3 mm. wide, the apical portions flattened, 15 (2 to 40) cm. long, 2 to 7 cm. wide, obtuse to subacute, lobed as on apex of the primaries.

Flowers from flattened, or rarely from terete or 3-angled, portions of stems, tubular-funnelform, 15 to 18 cm. long, the tube nearly straight on erect stems, more or less strongly upcurved on pendent stems, the limb ca. 12 cm. wide, the outer tepals pinkish cream, the inner creamy white; *pericarpel* not distinguishable externally; entire *receptacle* 11 to 13.5 cm. long, the lower half 7 to 10 mm. wide, yellowish green, darkest near base, the upper half ca. 7 mm. wide, pinkish amber-cream, the lower podaria acute, 3 mm. to 5 cm. long, the upper ones more obtuse, up to 8 cm. long, reddish near bracteoles, the bracteoles nearly appressed or slightly spreading, shortly or elongated deltoid, subobtusate, minutely mucronate, 1 to 6 mm. long, 0.75 to 1.5 mm. wide at base, fleshy, greenish with reddish membranous margins, the axils lacking wool or bristles; *outer tepals* widely expanded, ca. 5, linear-oblongate, acute, concave, 5.5 to 6 cm. long, 5 to 9 mm. wide at the widest point, the exterior pinkish cream tinged greenish, lighter near margin; *inner tepals* slightly ascending, 27 to 29, oblanceolate, acute, mucronate, 4.5 to 6 cm. long, 8 to 11 mm. wide, yellowish or greenish white; *ovule-chamber* elliptical, 9 mm. long, up to 4 mm. wide, the funicles branched, fimbriate along inner side of curve; staminal *nectaries* ca. 2.5 cm. long, hardly protuberant, non-papillose, faintly yellowish, the filaments further adnate to receptacle for 7 to 9 cm., forming a white membrane, the upper 1 cm. transversely rugose, all but the upper 3 cm. densely covered with minute, obtuse conical papillae; *stamens* arranged in ca. 4 nearly superimposed rows, all inserted in a zone 2 to 3 mm. wide, the filaments exserted 1.5 to 3 cm., slightly spreading, 2 to 3 cm. long, white, the anthers linear-oblong, light buff, 3 to 4 mm. long; *style* exceeding anthers by ca. 1 cm., 14 to 16 cm. long, ca. 1 mm. wide, slightly wider near base and apex, pinkish white, the lower half with dense, minute papillae, the stigma lobes 8 or 9, subulate, semi-expanded, ca. 11 mm. long, yellowish, densely papillose.

Fruit ellipsoid, 7 to 8 cm. long, ca. 5 cm. wide, the epidermis slightly shiny to rather dull, faintly fragrant, red, the venation visible as a darker red, protuberant reticulation, the podaria not

protuberant, their former ridge indicated by a line of lighter red extending ca. 5 cm. below each bracteole, the bracteoles ca. 7, deltoid, 1 mm. long and wide, the wool nearly absent; fruit apex with a slightly umbilicate, neck-like extension 3 to 5 mm. long and ca. 8 mm. wide, with dried persistent, brownish cream floral remains up to 12 cm. long; pulp pinkish white, with a pleasant taste; fruit finally drying or rotting without dehiscing.

Seeds ovate with the hilar end oblique, 3 to 3.75 mm. long, 2 to 2.25 mm. wide, ca. 1.5 mm. thick, the testa shiny, black, the cells nearly flattened, smaller and slightly more protuberant near the hilum, the hilum oblique, slightly curved in profile, ca. 1 mm. long, slightly depressed, whitish.

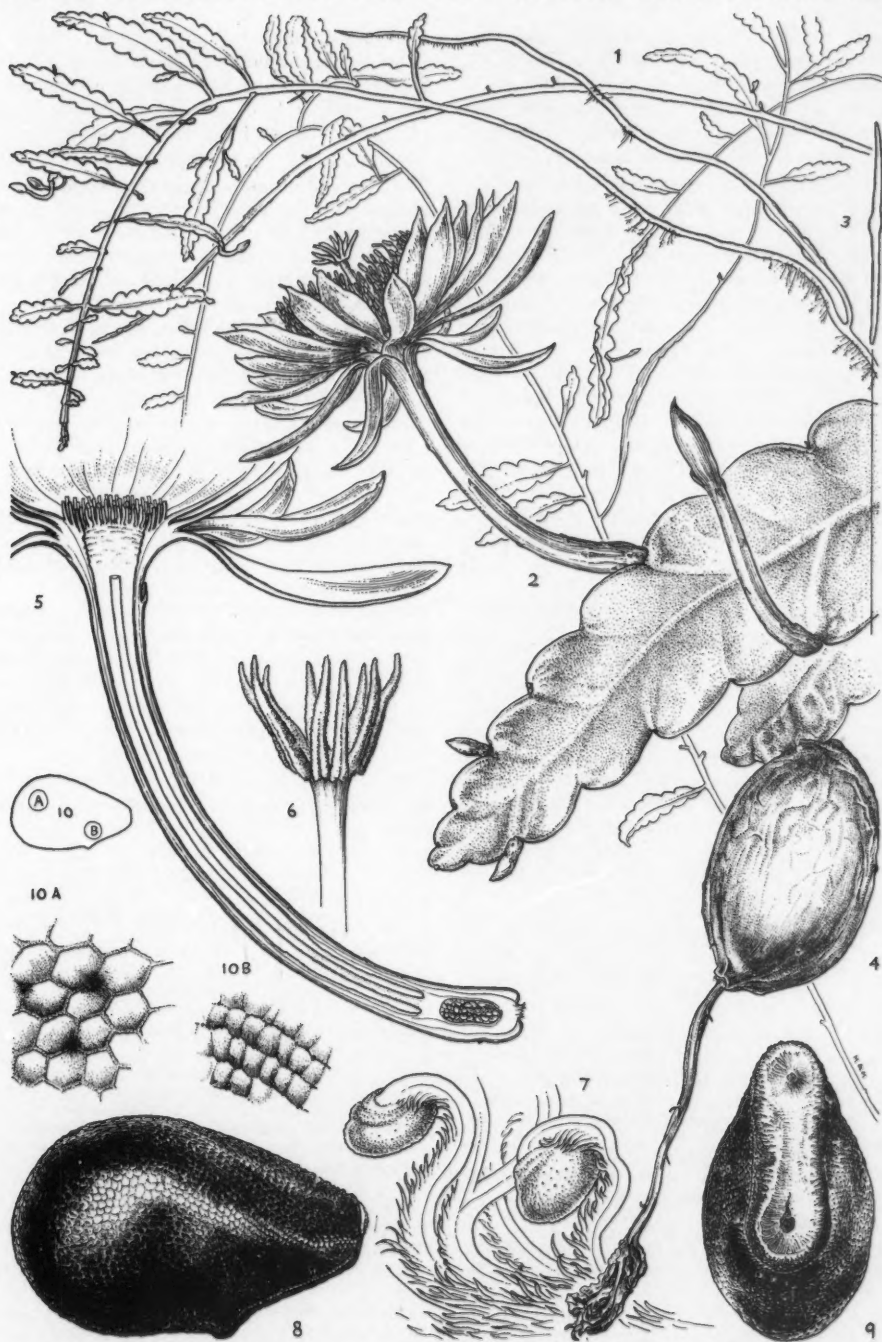
Costa Rica. Province of San José, San José, 1100 m., *A. Alfaro*, 1887 (US 795911). Province of Cartago: Cartago, *C. Wercklé* (US 68369); El Muñeco, south of Navarro, ca. 1400 m., *Standley* 33760, February, 1924 (US 1152724); vicinity of Orosi, *Standley* 39788, March, 1924 (US 1152742); near Cartago, *finca* Las Concavos, *C. H. Lankester*, *University of California Botanical Garden* No. 52.1097 (F, K, MEXU, UC, US).

The following specimens are incomplete but are probably referable to this species: Province of Cartago, Las Vueltas, Tucurrique, 635 m., *A. Tonduz* 13052, April, 1899 (US 795913); Province of San José, La Hondura, 1300 to 1700 m., *Standley* 37635, March, 1924 (US 1152728).

Morphologically, *E. cartagense* is rather isolated within the genus *Epiphyllum* [Herm.] Haw. The only published opinions concerning its affinities are by Weber,³ who stated that its flowers were similar to those of *E. pittieri* (Web.) Britt. & Rose, and by Schumann,⁷ who believed that it probably belonged to *E. hookeri* Haw. and *E. stenopetalum* (Först.) Britt. & Rose. The last three species are closely related and, with several others, comprise what may be called the *E. hookeri* alliance, after its earliest published member. While these species do have flowers closely resembling those of *E. cartagense*, they are very dissimilar to it in vegetative characters. Their stems are almost entirely flattened and branch mostly from the lower half, whereas in *E. cartagense*, *E. oxypetalum* (DC.) Haw. and *E. thomasiarum* (Schum.) Britt. & Rose⁸ the primary stems are long and terete with only the apical portion flattened; the secondary stems usually arise from the upper half of the primaries and are flattened except near their base. In ad-

7. Gesamtb. der Kakteen, Nachträge, 68, 1903.

8. Britton and Rose reduced this species to synonymy under *E. macropterum*, but we consider it to be distinct.



Epiphyllum cartagense (Web.) Britt. & Rose, U.C.B.G. 52.1097. 1. Primary and secondary stems with buds and aerial roots, much reduced. 2. Flower, side view, with buds and secondary stem, x 0.5. 3. Section of stem in 2, x 0.5. 4. Fruit, x 0.5. 5. Flower interior, x 1. 6. Stigma, x 2. 7. Funicles and ovules, greatly enlarged. 8, 9. Seed, x 15. 10, 10A, 10B. Cells of seed testa, greatly enlarged. Drawing by Mrs. M. Blos, 1957.

dition the stem lobes in the latter species are usually symmetrical and nearly semi-orbicular, whereas in the *E. hookeri* alliance they are obliquely asymmetrical. In stem characters, therefore, *E. cartagense* most closely resembles *E. oxypetalum* and *E. thomasianum*.

The flowers of the latter two species are comparatively primitive within the genus, having a large limb, wide tepals, many stigma-lobes, and a zone of staminal insertion extending nearly half-way down the receptacle. On the other hand, the flowers of *E. cartagense* and of the *E. hookeri* group are considerably reduced, with a smaller limb, narrow tepals, fewer stigma-lobes, and with the stamens inserted near or at the throat. In *E. phyllanthus* (L.) Haw., a species closely related to the *E. hookeri* alliance, the stamens are furthest reduced, being few and rather diffusely inserted in a zone only about 3 mm. wide; this approaches the condition in *E. cartagense* in which the zone is usually but 2 mm. wide, but the latter species is unique in the genus in having the stamens densely inserted in several nearly superimposed rows.

Despite similarities in the general appearance and staminal insertion of the flowers of the *E. hookeri* alliance and *E. cartagense*, it seems probable that floral reduction within two separate lines has here resulted in shared, but convergently developed, characters. Considering that the stem-growth of *E. cartagense* is most similar to that of *E. oxypetalum* and *E. thomasianum*, it is reasonable to consider it as belonging to the same line as those species but as being florally more reduced. Study of several species of *Epiphyllum* as yet little known may eventually confirm or modify this view.

Compared to those of its presumed allies, the terete stem portions of *E. cartagense* are exceptionally long; the secondary stems arise radially rather than in one plane, and the flattened-stem

lobes are more nearly semi-orbicular. Adventitious roots are abundantly produced on the long arching stems, which may thus become rooted at some distance from the main portion of the plant, enabling the latter to attain great size.

In the genus *Epiphyllum* and its allies the flowers usually possess external nectaries, and in *E. cartagense* a nectar-drop may often be observed on the bracteoles of both buds and opened flowers. This nectar has a heavy, sweet fragrance, compared by Wercklé² to that of a species of *Echinopsis*, the orchid *Trichopilia suavis*, or the flowers of the coffee plant. It can be detected even on half-grown buds, and is strongest about the outer tepals. In a newly-opened flower it is most concentrated within the perianth, but the copious nectar in the nectar-chamber is nearly odorless, a common occurrence in nocturnal-flowered cacti. Little is known concerning nectarial functions in cacti, but in these species it is possible that the bud-nectar acts as an added insect-lure for the flowers, only a few of which may be open at one time. It also seems probable that the content of the nectar-chamber, if sweet-tasting, need not also be fragrant as long as the perianth odor has sufficed to attract a pollinator. The odor is strongest at the beginning of anthesis, which occurs about 8 p.m., and is absent by the time the flower closes around 8 a.m. the next morning. Under our cultivation the flowering season usually occurs in May or June.

E. cartagense is easily grown and being native to rather high elevations probably thrives best under cool, but frost-free, conditions. It quickly grows into a robust specimen with the stems tending to become horizontal or pendent, and these should therefore be trained against a trellis or other support. The untidy growth and small flowers of this species are responsible for its lack of horticultural popularity, but its fragrance and edible fruit deserve wider appreciation.

OREGON CACTUS AND SUCCULENT SOCIETY

The following new officers were elected for 1958 at the annual Christmas party, held at the home of Mr. and Mrs. Don Cluster:

President: Russell Taylor
Vice-president: Mrs. Mildred Wellbaum
Secretary: Mrs. Beulah Lepley
Treasurer: Mrs. Laura Lechleider
Notification secretary: Mrs. Marion Minden

There were 26 present at the Christmas party, including our new members, Mr. and Mrs. Harold Derby, of Sweet Home, Oregon.

Mildred Wellbaum, Reporter

"Introduction to Desert Plants" is the new book by W. Taylor Marshall. The text of this book resulted from a series of lectures which the author has given several times a year for the past eight years. The pur-

pose is to explain the method of survival of the desert succulents, trees, shrubs, and wild flowers under desert conditions and their use for outdoor gardens in any moderate climate. Complete directions are given for growing from seeds, moving from natural habitat, soil and protection needed for successful growth of each type of desert plant. The illustrations and line drawings identify the most desirable species for garden use. 56 pages, 29 halftones, 1 map, and two plates of line drawings. \$1.25 postpaid.

CORRECTION

The address for the new Cactus and Succulent Journal in New South Wales should be 1 Robinson Lane (off 201 Edgecliff Rd.), Woollahra, NSW, Australia. This excellent quarterly magazine for amateurs is available at 2/10 per copy (to non-members) or \$1.75 U.S. money per year. It is easy to send by International Money Order.

SPOTLIGHT ON ROUND ROBINS

The New Year has arrived again, and although there is plenty of snow and cold around, it always seems brighter once we have turned the calendar to January. This is the year to resolve to do more, have a better garden, learn how to grow our plants properly, stimulate interest with some new cacti or other succulents, so why not join a Round Robin. You will never know until you do how much pleasure contacts with other members of our Society may bring you. Resolve to join right now while you are thinking about it! Write me and I shall find a place for you.

There are some new members to welcome into the Robin fold. Mr. Stanley C. Dedman, Godalming, Surrey, England; Miss Mary Alice O'Connor, Pittsburgh, Pennsylvania; Mrs. Joyce A. Churchill, Washington; Mrs. Ralph F. Armstrong, Covington, Virginia; Mr. W. R. Carr, Romford, Essex, England; Mrs. Myrtle Coe, Los Angeles, California.

One new Robin had taken flight since the last report. It is International R. Robin No. 3, whose director is Mr. Jesse W. Dodd, Jr., Phoenix, Arizona. Its subject matter is general, covering both cacti and succulents. I am happy to say that C. & S. R. Robin No. 3 has started out successfully after several of its flights had gone astray.

A request for a Robin on *Opuntias* has come in from one of our new members in England, Mr. W. R. Carr. Since he does not have a Robin for this genus exclusively would it be of interest to any of our members to have one? I never heard of anyone collecting *Opuntias* only, and they seem to be a more or less neglected class except for the more common species. I would be pleased to have your comments and to know if there are enough members to form a new Robin.

To correct an error, which was unforeseen at the time of my last report, I am sorry to say Mrs. Nancy Ann Duck, Grand Junction, Colorado, will be unable to be the Director of Winter-Hardy Cactus R. Robin No. 2 because of family illness. I do hope that possibly she may return to this Robin sometime, when her troubles have vanished.

In the notes from the *Euphorbia* Robin, Rose White has this to say about *Euphorbia obesa* which should answer a number of querying members who would like to know. "I am down to one pair of *E. obesa* but I have four lovely little seedlings about the size of a dime. I wonder how long it will take them to blossom and show what they are? It is truly a thrill to get some of these seeds to grow. Only a small proportion germinated for me. Last year, none. The female *E. obesa* does have an ovary at the top of the flower, but it does not show until the pistil is

fertilized, but you can tell your female anyway because the pistil comes up in the center of the flower and seems to branch into three tips at the end. The male plant just has a lot of stamens covered with pollen in the center." She says of *E. bubalina* that "if the seeds can pop into some soil that stays fairly moist you will have some little volunteer plants. It seems to grow more readily that way than if you plant and care for the seed. I have some plants that came up by themselves out in the garden and have stood several winters, so they must be hardy. Only the sturdiest of the *Euphorbias* will take outdoor treatment in the winter even here." (That is, California.) Mrs. Irma Huch says, "We have sure had rain, but the *Euphorbias* seem to enjoy all that water, seems they want more than cacti anyway. I have a *E. lactea cristata*, a fairly large one of a good fourteen inches high from the soil line and about twelve inches wide at the top. I give it plenty of water and it is really a beautiful specimen." Mrs. Ella Nipper added, "I know how beautiful *Synadenium grantii* can be." (belongs to the *Euphorbia* family) "When I had my four and a half foot plant it was covered with its unique blooms or bracts."

From Robin No. 6 Mrs. Billie Marie Anderson comments that "Chollas have taken six degrees below zero here in Texas, and no protection whatever, only shrink and droop but OK in the spring. Pretty blooms. They make fair-sized trees nearly and are native to Colorado and New Mexico where it gets colder than here." Of *Neobesseya missouriensis* she says, quoting from "Texas Cacti" by Schultz and Runyon, "the cactus is becoming very scarce and probably will become extinct." "I'll say this, they are plenty hard to find, for most will be up under low, dense bushes, and in the center of heavy briar patches. You look and feel like your arms and legs tangled with a bobcat before you get the plants out. In dry weather they recede level with the ground and are plain hard to find." Of seed sowing she has this to say, "I planted mixed cactus seed and had seed still coming up nine months to a year afterward. The fast growing ones had long since been transplanted." Mrs. Beverly Minson said, "There are lots of Mamms, of course. The hemisphaerica species is especially nice this year with its ring of white flowers outlined with last year's red seed pods. It's getting to be quite a large plant and very attractive." Irma Huch, who is also in this Robin gives some advice saying, "I lost more cacti at first by keeping too dry than any other way. Finally I wised up and watered. Cacti take a lot of water if the soil is loose. If they couldn't, my potted ones outside would have been mush long ago. I feed

mine lots too." Mrs. Frances Anderson says, "I like *Echinocereus* and have quite a number of them. *E. baileyi* is a beautiful purple bloom with dark red throat, green stigma and yellow stamens. I keep them in the south windows during the winter and water sparingly." She mentioned an unknown *Echinopsis* which bloomed for her in a very pale lavender or orchid color which lasted two nights and a day and perfumed the kitchen where she had it to watch it.

The Small Cacti and Mimicry Succulents Robin had some interesting notes. Mrs. Nona B. Mott, the Director, says, "I have repotted all five hundred of my succulents. Was that a job! A lot of fun, tho. Some of them were so rootbound they were yellow—in about a week after moving them to bigger pots they were a nice bright green again. I had been feeding them, too, but that just goes to show that they need room for roots regardless of how much they are fertilized." Then she inquires, "Say, have you tried this new—new to me anyway—Gibberellic acid? It is amazing what it will do. I used it on some *Pereksia* seedlings. And, whoops! They are growing so fast I am not sure it was a good idea. I put it on some other seedlings, too, but I can't see much change. It is not a fertilizer—it stretches the cells and speeds up the metabolism—or whatever plants have. It takes just twice or ten times as much feed and water tho. Makes seeds sprout in no time at all." Bruce Cutler has this to say, among other things, "I fancy you are not experiencing anything unusual with plants developing a pie crust. I have noticed it on quite a number of mine and seems to be more prevalent on plants that have had long resting periods. Where they stand for months, quite dry, in full winter sun they seem to develop a pie crust. Later when they finally decide to grow the crust will often crack and peel showing the new green growth beneath." He went on to speak of "the crazy habits of mimicry plants" and said, "I wrote to Mrs. Hall in South Africa and she says the *Gibbaeums* are rather adaptable and you can change them around to all the same season. The *Conophytums* grow and need water in late summer and autumn, and an occasional drink in winter. They rest in late winter and spring. *Lithops* must rest in the cold months and start gowing when the weather warms up in late spring, then they take plenty of water, providing drainage is good, till late autumn." Mrs. Doreen Murphy remarks on the price and size of some imported plants she has saying, "I have some such, with their roots cut hard back and very often shrivelled, that I have been trying to persuade to root for the past two years and despite my efforts still show very little sign. They have had every known method tried but I have lost about four in the process, and at 35/- each it is heartbreak, not to mention the

strain on the purse." (Note—one shilling or 1/- equals about 14 cents in U.S. currency.)

From C. & S. Robin No. 1, which has not had a report for some months, I thought these items were especially interesting. Agnes Hirshinger reports, "The first Paramount hybrid I bought—the Orange—has grown some eight or nine inches in height and about five in diameter. "It was in bud at the time she wrote. Also, she says, "For the first time I have not used any shading over the plants which are in a south window. I had to shade them the last two years. This year I had them out on the sills by day in early March and by mid-March, both day and night. I believe this toughened them to the very hot sun this summer. None has shown any signs of sunburn although many are very "colored" that normally are just green and this I find rather attractive. I plan to leave them out as late as I can without risk of frost and after that by day until it is definitely wise to bring them in for keeps." She then keeps her plants quite cold and in this respect says, "I'd not worry about a cold spot for them as much as one that is inclined to be too warm." Also in this Robin, Mrs. Edith Bestard gave a solution of household ingredients used to water her seedling cacti which have responded vigorously as well as tropical trees and other house plants which she said put out vigorous new growth. This solution is similar to the one used by Marsden and recommended for "soilless culture" Agnes said. The formula is: To one gallon of water add one tablespoonful each of Epsom salts, saltpeter, and baking powder with one-half teaspoonful of household ammonia. Edith said of her new plants, "My most beautiful acquisition is a large *Euphorbia mauritanica cristata*, commonly called African fan. It is a fitting companion for my lovely *E. lactea cristata*." To care for a lot of her potted cacti she went on, "Dad had made a hot bed on the south side of the greenhouse, with a hinged cover made of plastic glass. I mixed a lot of sand in and sank the pots to the rims, leaving the cover propped up but tilted to drain off the rain. I have never seen anything grow like those plants, and their coloring is beautiful. Some of my plants have been in the greenhouse, even though the rains have long ceased, and the temperature has been extremely hot. They are doing fine. Especially happy in such torrid environment are *Toumea payracantha* and *Tetradocactus glomeratus*. The last is truly beautiful."

A very happy New Year to you all and may there be many more Robins to report.

(MRS.) GLADYS H. PANIS,

P. O. Box 705, Falmouth,

Massachusetts

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EDITOR'S NOTE: Kindly report any corrections to the CACTUS JOURNAL, 132 W. Union St., Pasadena, California.

NOTICE TO AFFILIATES

The Cactus and Succulent Society of America, Inc., is happy to announce that we have a new set of slides to offer you for program material. Do not let the title confuse you. Except for only a few, these slides have never before been included in any of the slide sets. The slide sets available now are as follows:

Set No. 1—Cactus and other succulents Native to California (new set).

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Set No. 3—Orchid Cacti and Miscellaneous Succulents and Cactus.

Set No. 4—Orchid Cactus—Donated by S. E. Beahm of Beahm Epiphyllum Gardens.

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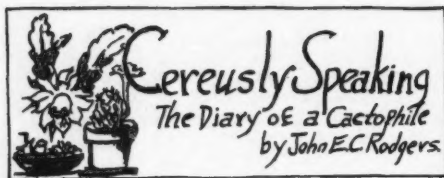
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TEXAS CACTI—Schulz and Runyon (1930)

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Scott E. Haselton—50c
CACTI FOR THE AMATEUR—Scott Haselton—\$3.65
VICTORY PICTURE BOOK—Hummel—50c
Abbey Garden Press, 132 W. Union St., Pasadena, Calif.



For many years I have grown seedlings from collected "home grown," bought, gift, etc. seed of cacti and observed them closely. I have been impressed by their vigor, similarity of form, uniformity of development, color and response to my growing conditions. Last summer while I was in Berkeley, California, I was given two fruits from orange-yellow *Echinopses* that have been introduced to the trade and collectors within the last 5-10 years.

I separated the seed from the pulp which was all ready quite dry and planted the seeds in three different soils: sandy loam, leafmold and loam, and leafmold and sand. In each soil I have observed the germination. Some were up in 3 to 5 days, others within two weeks and the rest within the month. I was surprised to see seedlings of orange, yellow, white, pink, red and green dot the soil. I charted the location by color. I found a high mortality rate among those other than greens. I studied them and found the white ones in general lacked a growing center and succumbed within two weeks after germination. The orange, yellow, and pink were next, although a few of the pink did turn a yellow-green and were able to survive but in a sickly condition. The reddish ones gradually turned green and soon could not be told from the green, except for a reddish tinge at the top. I noticed that the red exhibited an oval growing center which now has at least four more spine tufts than the green. If these keep up this condition it may be faciation or just another indication of lack of normal vigor.

Of the 120 seedlings in the three containers, the sandy loam soil covered with coarse sand has about one-third of the original seedlings left. The leafmold and loam has about one-half and the leafmold and sand has one-half of the originals left. I used coarse sand to discourage the growth of algae on the last two also. Each container has been covered with glass and ventilated by the usual lifting of said glass. There was no damping off in any of the three containers.

I do not claim I'm the best grower of seedlings but I've always had good success with my other *Echinopses* seedlings. I do not advance these observations as infallible but I do want to point out that I think these white and orange to yellow hybrids of *Echinopsis* have a poor heredity due to over hybridization of defective strains and that the high mortality rate is an indication of this fact. I intend to observe the remainder next year when growth begins. In the meantime I shall withhold my verdict "Rodgers vs. poor heredity."

Last May I planted seeds that I had been sent in 1953 of several species of cacti: *Lobivia huascha* with red flowers, *L. huascha* with yellow flowers, and *Echinopsis rhodotricha*. I prepared the soil as usual, put in drainage in a square, glass-lined, crisper of the refrigerator. I soaked the soil so thoroughly that when I scattered the seed on the surface I thought it was too wet and left the whole soggy mess uncovered in the sun to evaporate some of the water. When the surface looked drier I pressed in the seed, sifted sand over the whole surface, marked the kind, put on the lid and set it in semi-shade in my greenhouse.

I planted the seed as thick as possible, since I had been told that old seed germinated poorly if at all.

Plant fresh seed, etc. I was surprised when germination began within a week but the results were beyond all expectations—85 to 95 percent. After hearing the talk, "Some Factors Relative to Germination of Cacti" at our convention in July, I'm convinced that the sun-air treatment on the damp soil was part of the answer to the high percentage of germination of this old seed. The books say "use fresh seed" and "do not wait to plant unless too late in the season. If you have bottom heat for the seed bed, plant the same year, etc."

Perhaps we have been throwing away seed that was not too old, just too dried out to nourish the embryo. All the seed needed was a thorough sun bath and moisture to restore the vigor that was its heritage. I reread the articles by Eugene Ziegler, Spencerport, N.Y. See "Propagation of Cacti from Seed." Vol. I, April 1930 and Vol. III, October 1931 "The Growth of Algae in Seed Beds."

In August I visited Dr. E. J. Alexander at the New York Botanical Garden. I was glad to see the new succulent house which has been overhauled, rearranged, and catalogued so that xerophytes are again an attraction. The various constructive articles in the C. & S. Journal may have helped bring back the former renown which the N.Y. Botanical Garden once had.

In Boston I visited Vincent Mason. His beds of naturalistic plantings in full growth and many of them flowering made me wish I could have an all metal framed greenhouse with plenty of room to grow 15 to 20 foot tall cacti.

This is the fifteenth year I have written "Cereusly Speaking" the diary of a cactophile. Let me hear from you.

John E. C. Rodgers
1229 E. 8 St.,
Lorain, Ohio

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THE NEW YORK CACTUS AND SUCCULENT SOCIETY

The main business of the year-end meeting held December 8th was the election of officers for the coming year. By unanimous vote the following were reelected for another term:

Gerald C. Barad, Pres.

Abraham A. Bernhardt, Vice-Pres.

Helen Arp and Walter Mansell were elected to the Board of Directors.

In addition to the customary year-end reports, Walter Kluth, chairman of the Show Committee reported on the progress of his committee which is entrusted with the task of putting on our Society's exhibits at the New York International Flower Show to be held in March 1958. This was followed by our usual plant naming session to which members bring their unnamed plants for identification. This has proven to be one of the most popular program features. Next came the general gift exchange and the awarding of door prizes with special prizes going to the youngsters. It was decided at this meeting to make subscription to the Cactus & Succulent Journal mandatory for membership. This move was voted unanimously by the membership to show their united support of this most worthwhile publication.

The Society meets in the afternoon of the second Sunday of each month in the Members' Room, Museum Building, N.Y. Botanical Gardens, Bronx Park. Prospective members may inquire of the undersigned.

Joseph Emma, Sec'y.
274 First Ave.,
New York 9, N.Y.



SPINE CHATS

LADISLAV CUTAK



Tom MacDougall, the perennial visitor to Mexico, came upon an arborescent tree cactus in Oaxaca which has proven to be a new species. Helia Bravo of the Instituto de Biología, to whom photos and specimen were sent for verification, placed it in Backeberg's genus *Ritterocereus* which is characterized by funnel-form flowers with narrow tube, areoles of ovary with few or no hairs and fruit spiny without bristles. She named it *R. chicalapensis* after the type locality and full description appeared in *Anales del Instituto de Biología*, 27:311-319, (1956). *Ritterocereus chicalapensis* is a tall, much-branched cactus with a well defined woody trunk with the general aspect of *Lemaireocereus weberi*. Branches possess 7 prominent ribs and are marked with areoles containing 10 to 14 acicular spines. The flowers are white with recurving petals and are under 6 inches long.

Helia Bravo is also the author of two new cacti in the *Neodawsonia* genus. These two are *N. guingolensis* and *N. nana*. The former grows abundantly in lava rock on Guingola about 20 to 30 km. northeast of Tehuantepec in Oaxaca, Mexico. It has a simple to branching trunk with 22 to 25 narrow ribs which are punctuated by small round areoles bearing 10 to 13 acicular radial spines and 1 to 4 centrals. There is a short cephalium covered with wool and in its areoles are produced small rose-colored blossoms. The latter species, as its specific name indicates, is much smaller and stubbier, reaching an average height of only three feet. This one has 20 to 23 ribs upon which the areoles are closely set, bearing 7 to 12 acicular radial spines and up to 3 centrals. Its flowers are also rosy. This species is found in the region of Nizanda and Chivela, where I botanized in 1947, and also at La Ventosa and Agua Caliente, a few miles from the Pan American highway.

A. L. Haines distinguished and named five regional variants of *Yucca whipplei* as subspecies in 1941, discriminating between them primarily by differences of growth habit and the mean proportions of the inflorescences. In April 1957 Carl Epling and A. L. Haines located another new subspecies in Baja California, which is adapted to the most rigorous conditions of precipitation of any of the others and named it subsp. *eremica*. It is a regular and abundant associate of the ciriocardon community. It has a stout inflorescence, purplish flowers and a much branched habit and a southernmost range. This information is gleaned from *Brittonia* 9:171-172, Sept. 25, 1957.

Whilst preparing bibliographical data for *Index Genericorum* which is in course of publication, A. A. Bullock has from time to time published discussions on various taxonomic treatments of African plants in the *Kew Bulletin*. In No. 3 of 1956 issue he discusses the Asclepiadaceous genera *Decabelone* versus *Tavaresia*. The generic name *Tavaresia*, he states, appeared in an obscure list of Angolan plants, prepared by Welwitsch in 1854 but apart from its reference and a statement that the flowers are tubular, there was no description. N. E. Brown in 1903 supplied the description at length and since that time the genus has been universally accepted by all authors. However, Decaisne had described the genus *Decabelone* in the meanwhile and it

is clear that the name *Decabelone* must be restored. Thus, according to Bullock, *Tavaresia* is placed under *Decabelone* as a synonym.

Bharucha and Joshi made a study on the effect of prolonged darkness on acid metabolism in the leaves of *Aloe vera* and found that the highest accumulation of acid was seen after five days of starvation. Even though attempts were made to understand the exact nature of the reactions in Crassulacean leaves under prolonged darkness this problem still remains obscure. The only observation that can be made is that the acid metabolism in *Aloe vera* under conditions of starvation is more on similar lines to those of *Kleinia* and supports the view that all succulents may not behave in the same way as indicated by Bennett Clark. *From Science and Culture*, January 1957 issue.

Alfred Byrd Graf, general manager of the Julius Roehrs Company in Rutherford, New Jersey, is the author of a beautifully illustrated new book, appropriately called "Exotica." This large-size book of more than 600 pages is, as Mr. Graf describes it, a comprehensive and contemporary pictorial record of plants known to American horticulture, and cultivated for the enjoyment of their decorative qualities, strange foliage, or attractive inflorescence, in home, conservatory, or sheltered patio. It sells for \$17.50, which sounds prohibitive to most of us, but when you take into consideration the 4,000 illustrations of superb quality, you begin to marvel how the book could be published today at that modest price. Most of the well known plant families (to the number of 120) with interesting decorative subjects are represented and these include the ever popular bulbous plants, cacti and succulents, orchids, cycads, ferns, bromeliads, acanthoids, aroids, gingers and gesneriads. Although photos, color plates and charts make up most of the book, there are adequate pages devoted to text outlining the characteristics of families, lists of common names, glossary of botanical terms, codes to care and culture as well as propagation, plant geography and simple descriptions. *Exotica* is a monumental cyclopedia that needs to be placed in every home where a plant lover is located. It is highly recommended for the cactus and succulent plant enthusiast because 50 or more pages are devoted to his pet plants. If there ever was a MUST book to get, this is it, folks.

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ORANGE COUNTY CACTUS CLUB

Our Orange County Cactus Club is very active. The Sept. meeting was the celebration of our second birthday. At the Orange County fair last summer we won fourth prize in club contest at the fair with our exhibit, also a cash prize of fifty-five dollars with which we are establishing a library for the use of the club members. We have 35 members and at most every meeting we take in new members. We meet on the fourth Sunday of the month at the Jack Fisher Park Club House on north Flower St. in Santa Ana at 2 P.M.

E. Grove Teaney

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